COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
2003 INTEGRATED GAS RESOURCE PLAN
Docket No. D.T.E. 03-52

COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-1   Please explain why the real price of gas for commercials and the real price of distillate oil were deflated using the Consumer Price Index ("CPI") instead of the Producer Price Index ("PPI") (see page 4 of the Company's filing).

Company Response:

PPI was only used to deflate producer price variables; residual oil and industrial gas prices. Distillate oil and the price of gas for commercial customers were considered to be consumer price variables and were therefore deflated using the CPI.

Person Responsible: Robert B. Hevert

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DTE 2-2   Please clarify the discrepancies between the historical time period used in the customer class forecasts, stated on page 8 of the Company's filing (from 1983 to 1999), the same stated on page 16 and on page 20 of the Company's filing (from 1983 to 2002), and the historical time period stated on page 17 of the Company's filing (from 1983 to 2001).

Company Response:

The historic time period referenced on page 8 of the 2003 IRP filing is the time period used in the Company's previous IRP filing (2000 IRP filing – DTE 00-42). Pages 16, 17 and 20 reference historic time periods that were used in the current 2003 IRP filing. Pages 16 and 20 reference 1983 through 2002 which is the time period used for the dependent variables in the current filing. The time period referenced on page 17 (1983 through 2001) represents the data used for the independent variables in the current filing.

The original 2003 IRP filing, submitted on May 9, 2003, was based on data for the 1983 through 2001 time period. In the update filed on October 31, 2003, CEA incorporated the actual 2002 data for the dependent variables. The Company did not obtain new forecasts of the independent variables since this would have required additional significant cost. Thus, the 2002 independent variable data available for analysis was forecasted data rather than actual data. Although CEA used data through 2002 in determining regression equations and historical relationships among variables, the independent variable data for 2002 were in fact forecasts and not actual. Thus, CEA excluded 2002 from its listing of the historical period on page 17.

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DTE 2-3   Please discuss the consequences in terms of forecast reliability of aggregating the low and high load class volumes in the econometric model. Can the consumption patterns of both low and high load customer be explained by the same variables? Please discuss.

Company Response:

The Company has three commercial and industrial rate classes (small, medium, large) that for rate purposes are further disaggregated by low and high load factor resulting in six commercial and industrial rate classes in total. Based on the historical data set, the small commercial and industrial rate class has approximately 1,030 customers of which 757 or 74% are low load factor (G-41) and approximately 273 (26%) are high load factor (G-51). On an annual use per customer basis, the G-41 customers consume approximately 2,147 therms/customer, while the G-51 customers had an annual average usage of 1,776 therms/customer. Since the Company's forecast filing utilized annual volumes and the annual volume per customer for the G-41 and G-51 customers are comparable, CEA determined that the G-41 and G-51 customer classes could be aggregated.

Similar to the G-41 and G-51 rate classes the Company has two rate classes for medium sized commercial and industrial customers. The G-42 customer class represents the low load factor and G-52 customer class represents the high load factor customers. The medium commercial and industrial rate class has approximately 250 customers, of which approximately 166 (67%) are G-42 customers, and approximately 83 (33%) are G-52 customers. On a use per customer basis, the G-42 customers had an annual average usage of 19,175 therms/customer, while the G-52 customers had an annual average usage of 17,126 therms/customer. Since the forecast is conducted annually and the annual volume per customer for the G-42 and G-52 customers are fairly consistent, CEA determined that these classes could be aggregated.

The last commercial and industrial class is the G-43 and G-53 large volume rate class. This customer group has only 19 customers, of which 11 (60%) are low load factor (G-43) and 8 (40%) are high load factor (G-53).   Given the limited number of customers in the large volume segment, CEA utilized the combined customer class to develop forecast equations.

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DTE 2-3 (Continued)

Additionally, prior to model specification, low and high load factor customer data were weather normalized separately. This process effectively neutralized any bias in the data that may have resulted from load factor differences.

The Company believes that the consumption patterns of both low and high load factor customers can be explained by the same variables since annual data were used, the rate classes combined involve comparably sized customers (small, medium, large), and the data for low and high load factor customers were weather-normalized separately prior to aggregation.

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DTE 2-4   Please explain the following statement: "The historic relationship between firm throughput and total firm sales was projected on a statistical basis and applied to the total firm sales forecast to project future firm throughput" (see page 14 of the Company's filing). In addition, please:

         (a)   specify the length of historical relationship considered by the Company;
         (b)   discuss in detail how firm throughput was projected from that historical relationship;
         (c)   provide data of historical firm throughput and total firm sales used by the Company to forecast firm throughput.

Company Response:

Sales volumes were forecast at the customer class level. The aggregated customer class level sales volumes were then adjusted for company use and lost and unaccounted for gas. With the advent of retail transportation service, the Company needed to adopt nomenclature that addresses the volumes associated with transportation and those associated with sales. Therefore, firm throughput includes all Company volumes (firm sales, firm transportation, company use, lost and unaccounted for gas); while firm sendout is all of the above less the firm transportation. Please note that firm sales, as used in the 2003 Integrated Gas Resource Plan, is a component of firm throughput and represents the volumes sold under the Company's tariffs (which could include company sales and third-party sales).

     (a)   CEA utilized historic firm sales and throughput data from 1983 through 2002 to project firm throughput.

     (b)   To develop the firm throughput projection, the company utilized the following five step process. First, the Company compared historical annual firm throughput (which includes company use, lost and unaccounted for gas), and historical annual firm sales (which does not include company use and lost and unaccounted for gas). The percent difference between firm sales and firm throughput was calculated (this percent difference represents the company use and lost and unaccounted for gas). Next, this historical annual percentage was graphed and it was determined that (i)

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DTE 2-4 (Continued)

the company use and lost and unaccounted for gas percentage was decreasing over time; and (ii) a logarithmic relationship was observed. The third step in this process was to fit a logarithmic curve to the historical annual company use and lost and unaccounted for gas percentages. Fourth, utilizing the equation for the logarithmic curve developed in the previous step, company use and lost and unaccounted for percentages were forecast. The final step was to apply the forecasted company use and lost and unaccounted for gas percents to the total company sales forecast to obtain the firm throughput forecast.

(c)   Please see Table DTE 2-4 below.

Table DTE-2-4

Date	Firm Sales	Firm Throughput
1983	1,969,081	2,264,799
1984	2,116,900	2,308,408
1985	2,146,041	2,382,422
1986	2,101,932	2,301,293
1987	2,089,937	2,246,062
1988	2,194,820	2,386,083
1989	2,231,887	2,331,601
1990	2,122,095	2,128,701
1991	2,039,378	2,175,706
1992	2,328,104	2,371,888
1993	2,292,350	2,385,726
1994	2,305,683	2,378,027
1995	2,230,265	2,354,512
1996	2,450,760	2,445,314
1997	2,371,535	2,481,135
1998	2,202,714	2,208,798
1999	2,218,538	2,341,621
2000	2,399,354	2,540,061
2001	2,306,675	2,319,480
2002	2,247,951	2,334,472

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DTE 2-5   Please explain why the Company uses economic and demographic variables specific to Worcester County (POP, MANEM, SVCEM, NMEMP, DINCPC, DISINC, OUTPUT, HHOLD, HSTOCK, HHSIZE, and HSTART) instead of the Company's specific service territory (see page 17 of the Company's filing). Please, present evidence proving that data from Worcester County are appropriate proxy of Fitchburg's service territory.

Company Response:

The Company, in order to manage costs, purchased data that Global Insights had already developed for other projects or as part of their ongoing modeling of regional energy, economic and demographic variables. As shown in Table DTE 2-5 below, nearly 90% of the Company's customers are located in Worcester County, and many of these Worcester County variables were used and approved in DTE 00-42.

Table DTE 2-5

Town	County	Customers*	% Customers
Fitchburg	Worcester	11272	76.0%
Gardner	Worcester	1312	8.8%
Westminster	Worcester	314	2.1%
Lunenburg	Worcester	251	1.7%
Townsend	Middlesex	1575	10.6%
Ashby	Middlesex	114	0.8%
Total		14838	100.0%

*As of December 31, 2002

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DTE 2-6   Please refer to page 18 of the Company's filing. Please specify the components (gas commodity, distribution...) of the real price of gas to residential, commercial and industrial customers.

Company Response:

The nominal price of gas to residential, commercial and industrial customers was obtained by calculating the quotient of total revenues received from each customer segment each year over the quantity of therms sold to each customer segment. These nominal prices were then deflated by CPI (residential and commercial) or PPI (industrial) to determine real prices by customer segment.

The following table lists the various components of the total price of gas that customers in each customer segment face. Revenues from all of these components all feed into the total revenue referenced above and thus the real price of gas.

Table DTE 2-6			
Components of Total Price, Including Billing Determinant Basis			
Price Component	Residential	Commercial	Industrial
Customer Charge	Fixed Charge	Fixed Charge	Fixed Charge
Distribution Charge	All Therms	All Therms	All Therms, Maximum Daily Demand
Local Distribution Adjustment Clause	All Therms	All Therms	All Therms
Energy Conservation Charge	All Therms	All Therms	All Therms
Commodity Service	All Therms	All Therms	All Therms

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DTE 2-8   The Company used heating degree-days ('HDD") to normalize sales (see page 19 of the Company's filing). In this regard, please:

  (a)   define heating degree-days ("HDD") and effective degree-days ("EDD"). Please, emphasize the differences between those two temperature measures and how those differences applied to Fitchburg service territory;
  (b)   justify the use of HDD in the normalization of sales;
  (c)   show graphically, using line graphs, and also in a tabular form, the average monthly minimum, the average monthly maximum average HDD and EDD for the Company's service territory and for the past 20 years.

Company Response:

  (a)   Heating degree days ("HDD") are calculated by subtracting the average of the daily high and daily low temperature from a base of 65 degrees. HDD equal zero when the average daily temperature is above 65 degrees. Effective degree days ("EDD") are similarly calculated, but factor the impact of wind chill effect on the temperature data, typically yielding a value higher than HDD, which are calculated solely on the basis of temperature.

  (b)   FG&E utilizes HDD data, rather than EDD data, to weather-normalize historic sales and throughput data as part of its long term planning analyses. FG&E uses HDD data for two reasons. First, FG&E has a limited archive of historical EDD data. FG&E has tracked EDD data only since January 2000 and therefore has a three year history. The normalization process requires a substantial history in order to establish appropriate "normal" values. Second, HDD and EDD data are so correlated that switching from HDD to EDD would not change the results of any analyses that currently uses HDD data. For the three year period of January 2000 through December 2002, HDD and EDD in FG&E service territory are 99.98% correlated.

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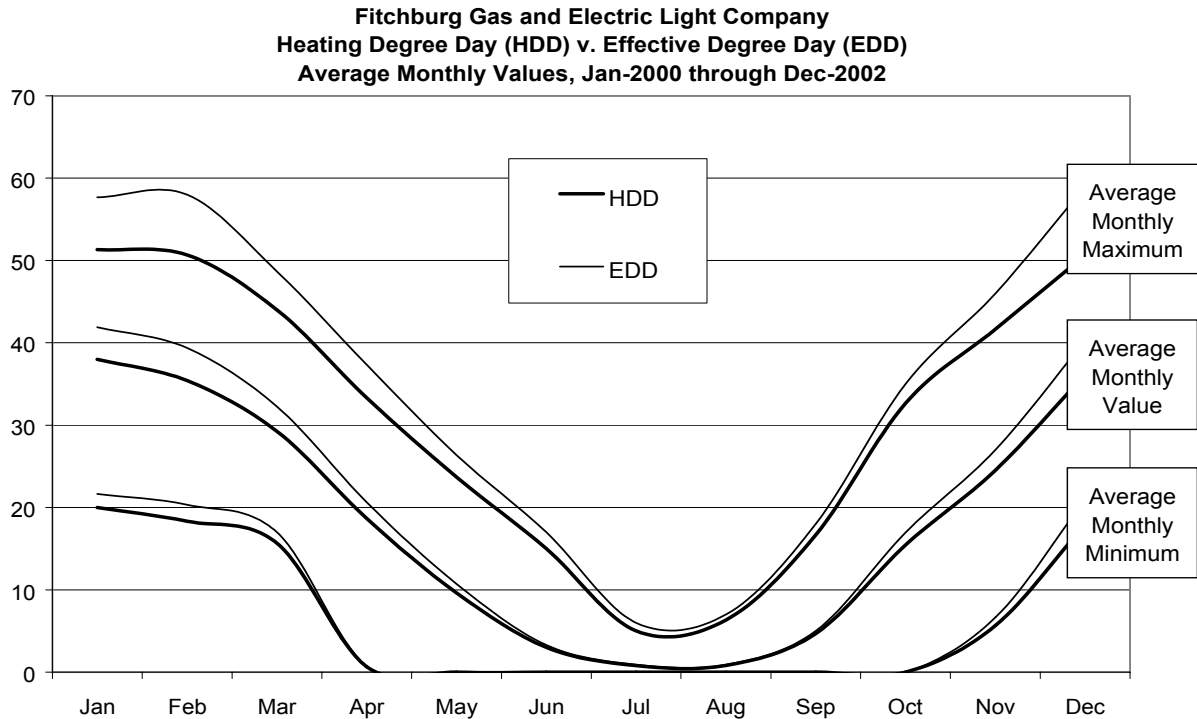**DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY**

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DTE 2-8 (Continued)

(c)   As mentioned in response to (b) above, FG&E has only tracked EDD data since
        January 2000. Chart DTE 1-10 (c) and Table DTE 1-10 (c) below show
        graphically and in tabular form the average monthly minimum, the average
        monthly maximum, and the average monthly value of HDD and EDD for the
        Company's service territory for the past 3 years.

Chart DTE 1-10 (c)

Fitchburg Gas and Electric Light Company
Heating Degree Day (HDD) v. Effective Degree Day (EDD)
Average Monthly Values, Jan-2000 through Dec-2002

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DTE 2-8 (Continued)

Table DTE 1-10 (c)

Fitchburg Gas and Electrric Light Company
Heating Degree Days (HDD) v. Effective Degree Days (EDD)
Average Monthly Values, Jan-2000 through Dec-2002

	Average Monthly Maximum		Average Monthly Value		Average Monthly Minimum	
	HDD	EDD	HDD	EDD	HDD	EDD
Jan	51.3	57.7	38.0	41.9	20.0	21.7
Feb	50.7	58.0	35.4	39.4	18.3	20.3
Mar	44.0	48.7	29.2	32.3	15.7	17.0
Apr	33.3	37.3	18.7	20.6	0.7	0.7
May	23.7	26.3	9.6	10.7	0.0	0.0
Jun	15.0	17.0	3.0	3.3	0.0	0.0
Jul	5.0	6.0	0.8	0.9	0.0	0.0
Aug	6.3	7.0	0.8	0.9	0.0	0.0
Sep	16.7	18.0	4.7	5.0	0.0	0.0
Oct	32.7	35.0	15.4	17.0	0.0	0.0
Nov	41.7	46.0	24.5	27.0	5.7	6.7
Dec	50.7	59.0	36.2	40.3	18.0	21.0

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DTE 2-9   The Company states that the weather data were not incorporated into the equations as explanatory variables, as all throughput data were weather normalized prior to estimation (see page 19 of the Company's filing). Please discuss why the Company used this strategy versus using non-weather normalized data and include the weather variable in the equation for the estimation.

Company Response:

In DTE 98-55 the Company was ordered to use economic and demographic variables (DTE 00-42 at 5) likely to affect the level of use at the customer class level. Consequently, the Company used weather normalized data as the dependent variable and specified regression equations using economic and demographic variables as the explanatory variables. In that respect, the Company believes that if weather were included among the independent variables, it would be difficult to find economic and demographic independent variables that would have significant explanatory power.

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DTE 2-10   Please specify the computer software used to estimate the forecast equations
             stated in Requirement Assessment section of the Company's filing and provide
             the input files printouts of each of the models.

Company Response:

CEA used a combination of SPSS for Windows, Release 11.5.0- Base, Regression models, and
Trends Packages and Microsoft Excel 2002 to estimate the regression equations.

Since the software utilized is Microsoft Windows based (i.e. menu driven), CEA did not develop
coded input files.

> **Residential Customer Equation**
> First, conduct a log transform of the residential customer data. Then, in Excel, graph the
> data over time. Add a trend line to the data set. CEA used a lognormal curve. On the
> options tab, select "display equation on chart" and "display r2 on chart"
>
> **Residential Sales Equation**
> First, conduct a log transform of the residential volume data, the household size variable
> (in SPSS: Transform/ Compute/ LN(each variable separately)). Then, run a Prais-
> Winsten autoregression procedure specifying the logged residential volumes as the
> dependent variable and the logged household size as the independent variable (in SPSS:
> Analyze/ Time Series/ Autoregression/ Specify independent and dependent variables,
> method is Prais-Winsten). Also, request that a constant is included in the equation (in
> SPSS: Analyze/ Time Series/ Autoregression / Check Include Constant in Model).
>
> **Small Commercial and Industrial Customer Equation**
> First, conduct a log transform of the small commercial and industrial customer data, the
> population variable, the services employment variable, and the trend variable (in SPSS:
> Transform/ Compute/ LN(each variable separately)). Then, run an ordinary least squares
> multiple regression analysis specifying the logged small commercial and industrial
> customers as the dependent variable and the logged population variable, the logged
> services employment variable, and the logged trend variable as the independent variables,

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DTE 2-10 (Continued)

where all independent variables are entered into the model (in SPSS: Analyze/
Regression/ Linear/ Specify independent and dependent variables, method is Enter).
Also, request Durbin-Watson results (in SPSS: Analyze/ Regression/ Linear/ Statistics/
Check Durbin-Watson under Residuals).

Small Commercial and Industrial Sales Equation
First, conduct a log transform of the small commercial and industrial volume data, the
services employment variable and the disposable income per capita (in real dollars,
deflated by CPI) variable (in SPSS: Transform/ Compute/ LN(each variable separately)).
Then, run an ordinary least squares multiple regression analysis specifying the logged
small commercial and industrial volume as the dependent variable and the logged
services employment and logged disposable income per capita as the independent
variables, where all independent variables are entered into the model (in SPSS: Analyze/
Regression/ Linear/ Specify independent and dependent variables, method is Enter).
Also, request Durbin-Watson results (in SPSS: Analyze/ Regression/ Linear/ Statistics/
Check Durbin-Watson under Residuals).

Medium Commercial and Industrial Customer Equation
First, conduct a log transform of the medium commercial and industrial customer data
and the manufacturing employment variable (in SPSS: Transform/ Compute/ LN(each
variable separately)). Then, run a Prais-Winsten autoregression procedure specifying the
logged medium commercial and industrial customers as the dependent variable and the
logged manufacturing employment as the independent variable (in SPSS: Analyze/ Time
Series/ Autoregression/ Specify independent and dependent variables, method is Prais-
Winsten). Also, request that a constant is included in the equation (in SPSS: Analyze/
Time Series/ Autoregression / Check Include Constant in Model).

Medium Commercial and Industrial Sales Equation
First, conduct a log transform of the medium commercial and industrial volume data, the
commercial gas price, the services employment variable and the disposable income
variable (in SPSS: Transform/ Compute/ LN(each variable separately)). Then, run an
ordinary least squares multiple regression analysis specifying the logged medium

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DTE 2-10 (Continued)

commercial and industrial volume as the dependent variable and the logged commercial gas price, the logged services employment variable and the logged disposable income variable as the independent variables, where all independent variables are entered into the model (in SPSS: Analyze/ Regression/ Linear/ Specify independent and dependent

variables, method is Enter). Also, request Durbin-Watson results (in SPSS: Analyze/ Regression/ Linear/ Statistics/ Check Durbin-Watson under Residuals).

Large Commercial and Industrial Customer Equation
First, conduct a log transform of the large commercial and industrial customer data, the residual oil price, and the population variable (in SPSS: Transform/ Compute/ LN(each variable separately)). Then, run an ordinary least squares multiple regression analysis specifying the logged large commercial and industrial customers as the dependent variable and the logged residual oil price and the logged population variable as the independent variables, where all independent variables are entered into the model (in SPSS: Analyze/ Regression/ Linear/ Specify independent and dependent variables, method is Enter). Also, request Durbin-Watson results (in SPSS: Analyze/ Regression/ Linear/ Statistics/ Check Durbin-Watson under Residuals).

Large Commercial and Industrial Sales Equation
First, conduct a log transform of the large commercial and industrial volume data, the disposable income variable, and the services employment variable (in SPSS: Transform/ Compute/ LN(each variable separately)). Next, run a Prais-Winsten autoregression procedure specifying the logged large commercial and industrial volumes as the dependent variable and the logged disposable income and the logged services employment variables as the independent variables (in SPSS: Analyze/ Time Series/ Autoregression/ Specify independent and dependent variables, method is Prais-Winsten). Also, request that a constant is included in the equation (in SPSS: Analyze/ Time Series/ Autoregression / Check Include Constant in Model).

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DTE 2-11   Please explain the following sentence: "Sometimes statistical relationships differ from a priori expectations yet still reflect plausible underlying relationships" (see page 22 of the Company's filing).

Company Response:

The first step in developing regression equations is to determine a priori expectations about the relationship between the independent variables and the dependent variable. The correlation between each independent variable and the dependent variable will either support or reject such a priori expectations. It is possible, however for the analyst's initial expectation of the relationship to be incorrect.

For example, in the analysis of medium commercial and industrial customers, CEA expected that manufacturing employment would have a positive correlation with the dependent variable; however, the correlation between manufacturing employment and medium commercial and industrial customers was negative. The relationship between *services* employment and medium commercial and industrial customers was positive, however. While this result was not the initial expectation, it is reasonable to conclude that the negative correlation between manufacturing employment and medium C&I customers and the positive correlation between services employment and medium C&I customers is illustrating the overall shift from a manufacturing to services sector economy.

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DTE 2-12   Regarding the forecast equations stated in Requirement Assessment section of the Company's filing, please:

    (a)   indicate the level of statistical significance of the estimates selected by the Company to determine whether or not an independent variable has explanatory power (see page 19 of the Company's filing);

    (b)   indicate whether the Company selected an "A Priori" level of statistical significance? Discuss why or why not;

    (c)   discuss whether or not the Company believes that the potential problem of multicollinearity among the independent variables was corrected by taking the logarithmic form of the variables. Please, explain why or why not.

Company Response:

    (a)   In general, the Company targeted p-values in the 0.05 to 0.10 range to determine whether or not a given independent variable had sufficient explanatory value to be included in the regression equation.

    (b)   The data available for the regression analysis involved relatively small sample sizes and dependent variables for which the majority of the data had been mapped from a prior rate structure to one that was implemented in the latter part of 1998. Consequently, the Company did not apply overly rigid "A Priori" rules with regard to an acceptable level of statistical significance. Values of $p=0.05$ or lower were considered strong, and values as high as $p=0.10$ were considered for inclusion.

    (c)   Potential multicollinearity among the independent variables was accounted for by examining the standard errors and the resulting t-statistics and p-values for each of the independent variables being considered in the regression equations. If multicollinearity were an issue, the standard errors associated with the collinear independent variables would be relatively high and would have produced low t-statistics and high p-values, therefore one or more of these collinear independent variables would have been eliminated from the regression equation.

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DTE-2-13   Please discuss the three different patterns, at three periods on time, showed by the number of residential customers variable (see page 26 of the Company's filing).

Company Response:

The three distinct trends in the history of residential customer counts since 1983 discussed in the Company's filing are historical phenomena that were described to support the use of a truncated history for forecasting purposes, the truncated history being only the period of the most recent of the three trends described. Specifically, the three periods are 1983 to 1990, during which residential customer counts grew by 0.6% annually; 1990 to 1995, during which residential customer counts declined by 1.25% annually; and 1995 to 2002, during which residential customer counts dropped by a less dramatic 0.23% annually. The Company is not aware of the precise cause or causes of these distinct historical patterns. They may have been due, in part, to the relative price of heating oil to natural gas during this period, and local oil companies' retail marketing efforts. Whereas the causes of these diverse historical patterns are not fully understood, and (as stated at page 26 of the filing) the intent of the forecast is to predict the five year period from 2003-2007, the Company believes that the most recent eight year period is most useful for that purpose.

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DTE 2-14   Regarding the forecasting equation for the number of residential customers (see pages 26-27 of the Company's filing). The Company states that it seems reasonable to truncate the historical data set to include only the more recent history from 1995 through 2002. In this regard, please:
(a)   explain what the Company means by "more reasonable";
(b)   discuss the consequences of not-incorporating all historical information available to the Company to forecast the number of residential customers
(c)   discuss whether the Company believes that the reason it could not find strong correlation between dependent variable and most economic and demographic variables is the result of using Worcester data instead of Company specific data.

Company Response:

(a) As was stated on page 26 of the 2003 IRP filing, the historical residential customer data has three different growth patterns over the twenty year time period. The early years, through 1990 illustrated growth; from 1990 through 1995 residential customers declined sharply, and; from 1995 through 2002, the data indicates a more stable rate of attrition. Based on that history, and given the lack of an underlying trend in the entire data set, the Company stated that it seemed ***reasonable*** to truncate the historical data set to include only the ***more recent*** history from 1995 through 2002.
(b) CEA reviewed the data set and the relationships between the independent variables and the residential customer counts, ran numerous regression equations, and did not find a regression equation that resulted in a reasonable forecast of residential customer counts. Absent the decision to truncate the data set, it was unlikely that an equation would be developed that would fit the data and result in a reasonable projection of residential customer growth over the forecast period.
(c) CEA does not believe that the use of Company specific demographic variables would have assisted in the development of a regression equation that utilized the entire data set from 1983 through 2002. The fact that there were three distinctly different patterns of growth in a very small data sample for the dependent variable most likely was the obstacle to developing a regression equation.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
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DTE 2-15   Regarding the residential volume regression (see pages 27-30 of the Company's filing):

      (a)   discuss how the Company evaluates the R2 of 0.625;
      (b)   does the Company think that the reason it could not find strong correlation between dependent variable and most economic and demographic variables is the result of using Worcester data instead of Company specific data?

Company Response:

(a) As is illustrated in Chart DTE 2-15 below, the historical residential customer usage was somewhat erratic during 1983-2002, making it comparatively difficult to develop a regression equation with strong statistics. As a result, the final regression equation does have a lower R2 than the other equations produced in this analysis, however the F-statistic for the equation was significant and the forecast generated using this equation seems consistent with recent experience on the FG&E system for residential customer usage. Therefore, CEA chose to accept the equation.
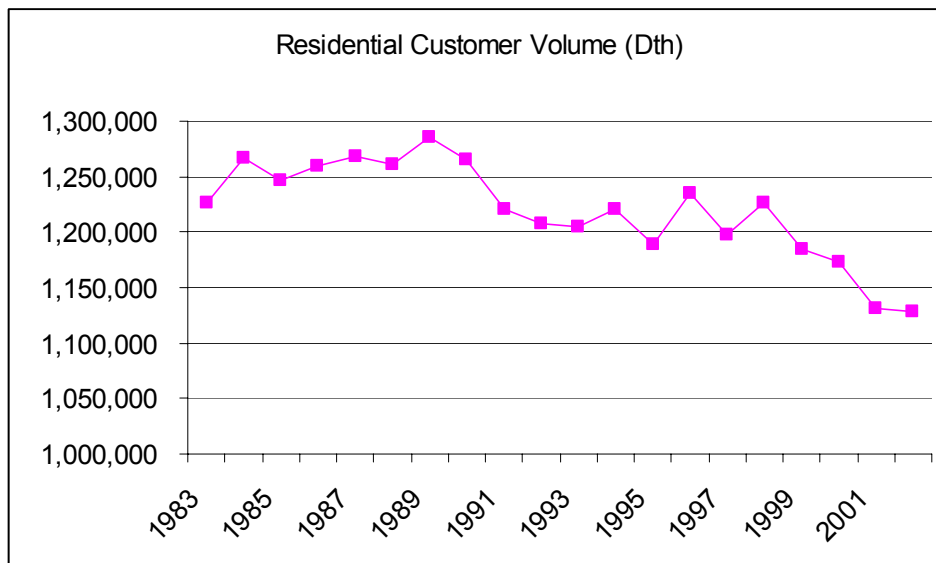
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DTE 2-15 (Continued)

Chart DTE 2-15

Residential Customer Volume (Dth)

(b) No. CEA believes that the difficulty in developing strong correlations between demographic variables and the data set was the result of the variability in usage that has occurred in the residential customer segment. It is not likely that the use of Worcester area data instead of FG&E specific metrics would have improved this result.

Person Responsible: Robert B. Hevert

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DTE 2-16   Please refer to the residential forecast results (see page 30, Table 2.8 of the Company's filing). The Company states that the residential customer and sales equations performed well. In this regard, please, discuss why the Company believes that a 3.2 percent, 4.6 percent, and 4.6 percent variances for the years 1998, 2001, and 2002 respectively in residential sales is a good performance.

Company Response:

On page 30, the Company states that the backcast results for the residential customer equation are reasonably close to the actual historical number of residential customers. The judgment was made in light of the backcast results over the entire historical period. That is, the Company was satisfied that the overall backcast results for residential customers and sales produced average absolute variances of only 0.2% and 2.8%, respectively, over the 5 year backcast period. In addition, when the sign of the annual variances is taken into consideration (i.e. positive and negative variances are allowed to offset each other) the average variance is only 0.1% and 1.5% for residential customers and residential sales, respectively.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
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DTE 2-17   Please refer to the small commercial and industrial customer regression (see pages 32-34 of the Company's filing). In this regard, please explain the following statement: "it is more likely that the population variable is tempering the strength of the service employment variable" (see page 33 of the Company's filing)

Company Response:

The quotation above references an explanation provided in the 2003 IRP filing regarding the change in sign of the coefficient of the independent variable SVCEM when used as an explanatory variable for small commercial and industrial customers. As is indicated in Table 2.12 on page 32, the correlation between SVCEM and small commercial and industrial customers is positive. This relationship makes intuitive sense; as services employment increases, small commercial and industrial customers are likely to increase The final regression equation uses SVCEM and POP, two independent variables that each have high positive correlations with small commercial and industrial customers. When combined in the regression equation, the sign of the coefficient of SVCEM was negative. CEA believes that this change in sign between the correlation table and the regression equation is the result of the interaction between the two independent variables when used together in the equation. As explained on page 33, removing either of these independent variables compromised the explanatory capability of the equation; therefore CEA is satisfied with the contribution of the variable SVCEM to the equation.

Person Responsible: Robert B. Hevert

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DTE 2-18 Please refer to the small commercial and industrial volume regression (see pages 34-36 of the Company's filing). In this regard, please:

    (a)   define the variables "DINCAP" and "DINCPC" and explain the differences between them;

    (b)   discuss whether the variable "disposable income per capita" was deflated when used in the regression;

    (c)   explain why the Company chose two measures of economic growth to forecast volume. Was not enough to count on one measure of economic growth?

    (d)   graph, using line graphs, and a tabular form, the relationship between the "DINCPC" and the "SVCEMP" variables respect to time (1983-2002);

    (e)   graph, using line graphs, and a tabular form, the relationship between the "DINCPC" and the "SVCEMP" variables in logarithmic form respect to time (1983-2002);

    (f)   discuss why the Company believes that the statistical relation between "DINCPC" and "SVCEMP" is going to continue in the future.

Company Response:

(a) The variable label "DINCAP" and "DINCPC" both refer to disposable income per capita. In the updated filing, filed on October 31, 2003, the label was changed from DINCPC to DINCAP. In the equation for small commercial and industrial volume on page 35, the variable was mistakenly not relabeled.

(b) The data set for disposable income per capital was deflated using CPI.

(c) In developing the final regression equation, the Company considered equations that used one measure of economic growth, however the use of disposable income per capita and services employment together in the final regression equation produced the best overall fit.

(d) **REDACTED**

(e) **REDACTED**

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(f) The statistical relationship between SVCEMP and DINCAP in the future has not specifically been considered by the Company. Rather, the Company expects that SVCEMP and DINCAP will, separately and jointly, continue to reasonably predict changes in the number of small commercial and industrial customers.

Person Responsible: Robert B. Hevert

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DTE 2-19   Please refer to the small commercial and industrial forecast results (see pages 36-38, Table 2.16 of the Company's filing). Please discuss how the Company evaluates the results of the backcast analysis of sales.

Company Response:

The Company was satisfied that the overall backcast results for small commercial and industrial customers and sales produced average absolute variances of only 1.4% and 4.0%, respectively, over the 5 year backcast period. In addition, when the sign of the annual variances is taken into consideration (i.e. positive and negative variances are allowed to offset each other) the average variance is only 1.3% and -0.1% for small commercial and industrial customers and sales, respectively.

The results of the backcast for each individual customer segment indicate somewhat broader variances, due in part to the relatively small sample size and the data transformation issues related to the transition to the new rate structure. Due to these issues, CEA reviewed the results of the backcast on a total company basis. This allowed CEA to evaluate the capabilities of the set of regression equations to predict the total company demand. This analysis is summarized in Table 2.35 on page 51 of the 2003 IRP filing. On a total company basis, the backcast produced a mean deviation of -0.3% for total sales volume. On an absolute basis, the backcast of the total company demand was within 1.7%. CEA believes that this level of variance is reasonable.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
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DTE 2-20   Please refer to the medium commercial and industrial volume regression (see
              pages 41-43 of the Company's filing). In this regard,

              (a)   discuss the rationale for including the variable "DISINC" and specify
                       whether or not this variable was deflated;
              (b)   discuss the meaning of the negative sign of the variable the "DISINC".

Company Response:

              (a)   As is discussed on page 42 of the Company's filing, disposable income
                       ("DISINC") provides a reasonable measure of the growth in the economy, which
                       CEA expects would influence the growth in medium commercial and industrial
                       natural gas consumption. This variable was deflated using the CPI index.
              (b)   The negative sign referred to in the question is on the coefficient of DISINC in
                       the final regression equation for small commercial and industrial volumes. The
                       direct relationship between DISINC and medium commercial and industrial
                       volumes is positive, as illustrated in the correlation table (Table 2.22) on page 42
                       of the IRP filing. This relationship makes intuitive sense; as the economy grows,
                       so should the natural gas usage of medium commercial and industrial customers.
                       The final regression equation shown on page 42 of the IRP filing includes
                       DISINC, SVCEM, and POP. When all of these variables were combined in the
                       regression equation, the sign of the coefficient of DISINC was negative. CEA
                       believes that this change in sign between the correlation table and the regression
                       equation is the result of the interaction between the three independent variables
                       when used together in the equation. Removing any of these independent variables
                       compromised the explanatory capability of the equation; therefore CEA is
                       satisfied with the contribution of the variable SVCEM to the equation.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
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DTE 2-21   Please refer to the forecast results (see pages 30, 36, 43, and 50 of the Company's filing). Please state and discuss the levels of "Mean Absolute Deviation" and "Mean Deviation" which would make the Company not satisfy and consequently remodel the forecast equations.

Company Response:

As is discussed in response to DTE 2-19, given the data issues, CEA has evaluated the results of the forecast on a total company basis. The backcast of total company sales was within -0.3% on average and 1.7% on an absolute basis, which CEA believes is reasonable. CEA did not develop a specific threshold level of Mean Absolute Deviation or Mean Deviation above which the equations were to be re-specified.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
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DTE 2-22   The Company indicates that it developed the total company throughput forecast by analyzing the historic relationship between end use consumption and total company throughput requirements and that the resultant analysis was utilized to forecast total company throughput requirement (see p. 53 of the Company's filing). In this regard, please:

     (a)   provide the historic relationship between end use consumption and total company throughput requirement in a separate table;

     (b)   discuss in detail how the Company used that historic relationship to project the firm throughput over the period 2003-2007;

     (c)   discuss why the Company does not present any "Company Use" (see p. A-9 of the Appendix of the Company's filing).

Company Response:

    (a)   Please see Table DTE 2-4(a).

    (b)   Please see response to DTE 2-4.

    (c)   Similar to the approach used in FG&E's most recent integrated gas resource plan filings, the 2003 Integrated Gas Resource Plan addressed the Company Use and Unaccounted For on a percentage basis and therefore did not forecast it in MMBtus. As such, historical MMBtu data and forecasts for Company use and Unaccounted For volumes were not presented on page A-9.

Person Responsible: Robert B. Hevert

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DTE 2-23   Please explain how the Company counts on the energy saving stemming from
                DSM measures to develop the firm throughput forecast.

Company Response:

The Company implemented gas DSM measures beginning in 2000. DSM savings from the
historic period were added back to historic sales prior to developing the forecast. The Company
does expect future DSM savings as documented in its "Year End 2002 Status Report and
Proposed Program Updates" filing, dated March 18, 2003, and approved by the Department on
July 3, 2003. The filing is attached as Attachment DTE 2-23.

Expected future DSM savings were removed from the firm throughput forecast prior to FG&E
establishing its resource mix. Page A-42 (1 of 2) of the Appendix shows the DSM savings
expected over the forecast horizon and demonstrates the netting of DSM savings from the
projected throughput in order to establish the supply requirements. Page A-42 (2 of 2) of the
Appendix reconciles the throughput forecast shown on Table 2.40 (Page 58) to the total supply
requirements shown at the top of Table 3.4 (Page 82).

Person Responsible: Robert S. Furino

Fitchburg Gas and Electric Light Company

Gas Energy Efficiency Programs
2000 – 2003

Docket No. D.T.E. 98-049

Year-End 2002 Status Report and
Proposed Program Updates

Filed with the
Massachusetts Department of Telecommunications and Energy
March 18, 2003

Table of Contents

I. Introduction

On May 15, 2000, Fitchburg Gas and Electric Light Company ("FG&E" or the "Company") submitted to the Department of Telecommunications and Energy ("Department") a proposed Gas Energy Efficiency Program Plan for the three-year period July1, 2000 through October 31, 2003 (docketed as D.T.E. 98-49). As part of its plan, the Company detailed several energy efficiency programs and marketing initiatives for its residential, low-income and commercial and industrial ("C&I") customers. Moreover, the Company provided the Department with proposed budgets for those programs. As a result of negotiations and collaboration among FG&E, Settlement Intervention Staff ("SIS") appointed by the Department, the Low-Income Energy Affordability Network ("LEAN"), the Montachusett Opportunity Council ("MOC"), and the Massachusetts Community Action Program Directors' Association ("MASSCAP") (collectively, the "Parties") the Parties submitted a Joint Motion for Approval of a Settlement Agreement ("Settlement") to the Department. The Settlement, approved on September 13, 2000, incorporated descriptions of the gas energy efficiency programs and the associated program budgets. The Settlement also addressed the cost-recovery mechanism, including recovery of lost base revenue, put in place by the Company.

The Company is pleased to file this Program Status Report and Proposed Program Update with the Department which will: (1) summarize the Company's gas DSM activities over the past 2 program years; (2) discuss key changes that have been made to specific program initiatives; (3) present FG&E's proposal for additional programs; and (4) provide updated program budgets for 2003 and 2004. FG&E and the Parties to the Settlement in Docket DTE 98-49, request that this filing be incorporated as an addendum to the original Settlement and that all clauses in that document remain in effect except as superceded by this Status Report and Proposed Program Update.

II.   Program Status and Experience Through 2002

FG&E operated a number of gas energy efficiency programs and market transformation initiatives targeting residential, low-income and C&I customers during the past two years – 2001 and 2002[1]. These programs represent a concerted effort by the Company to develop a portfolio of services for its customers that: encourage more efficient gas usage; overcome market barriers; and seek to transform markets for energy efficiency. Following is a brief description and status discussion for each program (grouped by customer sector). A summary of budgeted and actual expenditures is included in Appendix A along with participation and savings information for each of the programs. A summary of proposed changes to FG&E's gas programs are included in Appendix B.

A. Residential Programs

During the past two program years, FG&E has been offering the following residential energy efficiency programs and initiatives:

- High Efficiency Space Heating Program (a GasNetworks® initiative[2]); and
- High Efficiency Water Heating Program (a GasNetworks® initiative).

i. Status of High Efficiency Space Heating Rebate Program

The High Efficiency Space Heating Rebate Program is being implemented in Massachusetts collaboratively by GasNetworks®-member utilities. This program has been successful in promoting the installation of natural gas furnaces and boilers through the use of mail-in rebates. Over the past 2 years, a total of 48 rebates have been issued to FG&E customers (38 furnace rebates and 10 boiler rebates). During 2002, rebate levels for furnaces decreased from $400 to $300 and decreased again to $200 in November 2002 (start of the 2003 program year). The lowering of rebate levels is a result of sustained and continued growth of high efficiency furnaces in the marketplace, thereby signifying progress toward transforming the high efficiency furnace market. However, high efficiency forced hot water boiler installations are significantly lower in comparison. In an attempt to stimulate this market and to partially offset the high incremental cost between standard efficiency and high efficiency boilers, GasNetworks® has increased the rebate level for boilers from $400 to $500 beginning in November 2002.

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1. FG&E's gas EE program year runs from November 1 to October 31.
2. GasNetworks® is a Massachusetts Natural Gas Energy Efficiency/Market Transformation Collaborative.

ii. <u>Status of High Efficiency Water Heating Rebate Program</u>

The High Efficiency Water Heating Rebate Program, which offers mail-in rebates on natural gas water heaters, is being implemented in Massachusetts collaboratively by GasNetworks®-member utilities. Participation for this program has been significantly less than anticipated for the Company's service territory. In total, 22 efficient water heater rebates have been issued since program launch in November 2000[3]. The Company believes that this dynamic has been experienced by the other MA gas utilities. FG&E plans to take steps to improve penetration levels on its own through a concentrated marketing effort in 2003 and regionally through GasNetworks®, but recognizes market transformation of the residential hot water heating market will be gradual as well as challenging. This can be attributed to: lack of consumer/contractor education; lack of product availability; and reluctance by contractors to make the extra effort needed to sell consumers equipment that is more expensive.

B. Low-Income Programs

During the past two years FG&E has been offering a residential low-income energy efficiency program. The status of the program is discussed below.

i. <u>Status of Residential Low-Income Program</u>

FG&E's Low Income Program offers energy efficiency measures to customers with incomes at or below 200% of the federal poverty level. The measures and services available include air-sealing, duct sealing, and heating system repair or replacement (on a qualifying basis). One hundred, fifty-four (154) eligible low-income customers have participated to-date (including 3 furnace and boiler replacements done in conjunction with the Massachusetts HEARTWAP program).

In addition, per the Settlement Agreement, FG&E has been coordinating its low-income program delivery efforts with MOC, the non-profit, weatherization assistance agency in its service territory and has supported LEAN's efforts over the past two years to provide coordination and program services to benefit low-income customers.

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[3] Through October 31, 2002.

C. Commercial & Industrial Programs

FG&E has offered the following C&I gas energy efficiency programs during the past two program years:

- Small / Medium C&I High Efficiency Space Heating Program (a GasNetworks® initiative); and

- Large C&I Custom Installations Program (a Company-specific program)

i. Status of Small / Medium C&I High Efficiency Space Heating Program

The Small / Medium High Efficiency Space Heating Rebate Program provides commercial customers with financial incentive for the installation of ENERGY STAR®-rated, high efficient heating equipment. During the past two years, a number of FG&E customers have taken advantage of this program – though less than anticipated – to choose the more energy efficient alternative. In total, 8 customers have received high efficient furnace rebates through this program. A concentrated marketing effort is planned for 2003 and the Company will continue its contractor training initiatives, and other endeavors individually and regionally through GasNetworks® to further the transformation of the energy efficient gas heating equipment market.

ii. Status of Large C&I Custom Installations Program

The Large C&I Custom Installations Program is designed to promote installation of high efficiency gas space heating and cooling equipment, water heating equipment, improve operations and maintenance practices, and encourage other custom/site-specific efficiency measures (*e.g.*, process system and building shell improvements, load shifting, etc.) in large C&I facilities and to increase awareness so that similar opportunities are not overlooked in the future.

This program targets the Company's largest C&I customers with annual therm usage of greater than 80,000 therms. The program offers rebates for new construction and failed equipment (lost-opportunity) applications and promotes improved O&M practices. In addition, the program builds off of the existing market infrastructure through training and awareness campaigns, and utilizes regional resources where possible.   Coordination with GasNetworks® rebates and outreach efforts is an important element of the Company's Large C&I Custom Installations Program and has helped FG&E to effectively leverage its limited program funding. A summary of some of these GasNetworks® market transformational outreach efforts is presented below:

Various Company marketing activities and contractor training promotions have been done singularly and in coordination with GasNetworks®. Over the last two years, the Company, in conjunction with GasNetworks®, was successful in developing partnerships with equipment manufacturers and home-goods retailers. As a result, point-of-purchase displays promoting the various rebate programs are now in all Sears and Home Depot stores across the state. Also, the GasNetworks®-member utilities, have become recognized sponsors of major heating equipment and controls manufacturers such as Weil-McLain Boiler Company and Honeywell Inc. In addition, FG&E has held and/or sponsored several training workshops for local contractors in effort to promote its gas programs. FG&E intends to continue nurturing and expanding these relationships as a means to promote energy efficiency.

III.   Program Changes and New Program Additions in for 2003[4]

This section identifies key changes and new program additions proposed for implementation during program year 2003 (and continuing in program year 2004). These modifications are based on results, experience, and understanding gained by FG&E and other MA gas utilities through administration and implementation of the existing portfolio of Company-specific and regionally-oriented (GasNetworks®) EE programs during the past years.   In order to further develop the Company's EE programs for the 2003 period and beyond, a number of steps were undertaken – including:

1. Review of historical budget, implementation, and participation data for the existing EE programs;

2. Consideration of program additions and changes to more effectively meet the needs of FG&E's customers;

3. Discussion with other utilities regarding their experiences in order to better understand potential program improvements; and

4. Program and measure level screening and cost-effectiveness tests on seven existing EE programs and a variety of new program options utilizing Unitil's cost-effectiveness analysis tool (discussed in Section V. below).

Based on results from each of these steps, FG&E proposes to continue offering each of the programs described in Section II during program year 2003, incorporating the previously stated modifications in some rebate amounts and subsidy percentage levels.   In addition, the Company is proposing to combine its existing residential GasNetworks® high efficiency gas space and water heating programs into a single program and to add two new programs as discussed in more detail below.   See Appendix B for a complete list of changes and additions to FG&E's gas energy efficiency programs.

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[4] The program year 2003 runs from November 1, 2002 to October 31, 2003.

A. *Residential GasNetworks® High Efficiency Space and Water Heating Program*
(merges two programs into one)

FG&E proposes to combine the existing GasNetworks® Residential High Efficiency Space and Water Heating Programs into a single program providing the same services as presently offered through the separate programs. The merger of the two programs is easily accomplished due to the identical target market and delivery mechanisms and will allow the Company to manage and track the programs more easily and thereby decrease administrative expenses.

B. *Residential Weatherization Program*
(a new initiative)

FG&E is proposing implementation of a new company-specific Residential Weatherization Program. This program will "piggyback" on the existing state-mandated Residential Conservation Services program and will offer subsidies for consumers to install attic and wall insulation, and air sealing measures. Other measures and services include duct sealing, programmable thermostats, furnace and boiler maintenance and high efficiency window replacements. Typically, shell measures are very cost-effective and the Company believes that there is an untapped market in its service territory. Therefore, with two exceptions, rebate levels are set at the full incremental cost of the high efficiency measure in order to stimulate customer participation. For thermostats, the rebate is a fixed $50.00 per thermostat, with a two per household limit. The rebate for high efficiency window replacement is set at 50% of the incremental cost, with a cap of $500 per household.

C.   *Residential Low-Income Program*
(existing program – slight change to eligibility criteria)

The Company proposes to increase the income eligibility criteria for customer participation in its Residential Low-Income Program from 200% of the federal poverty level to 60% of median income. This higher income eligibility level, which is the maximum allowable under the federal fuel assistance program, is consistent with low-income energy efficiency programs offered by other electric and gas utilities in Massachusetts. FG&E is not proposing any other changes to measures or services of the Residential Low-Income Program.

D.   *Small / Medium Commercial High Efficiency Space Heating Program*
(merged into the C&I "Custom Installations" programs)

FG&E proposes to offer the GasNetworks® rebates, previously offered through the Small / Medium Commercial High Efficiency Space Heating Program, through the new or existing C&I Custom Installations programs (discussed below). In this way,

utility representatives can more effectively assess C&I customers' needs and recommend GasNetworks® rebated high efficiency heating and water heating measures where appropriate.

E. Small / Medium C&I Custom Installations Program
(a new program)

Like the Company's existing Large C&I Custom Installations Program, the Small / Medium C&I Custom Installations Program is designed to promote installation of high efficiency gas space heating and cooling equipment, water heating equipment, improve operations and maintenance practices, and encourage other custom/site-specific efficiency measures (e.g., process system and building shell improvements, load shifting, etc.) in smaller to medium (<80,000 annual therm usage) C&I facilities.

The program offers rebates for new construction and failed equipment (lost-opportunity) applications including and beyond the current GasNetworks® high efficiency furnace, boiler and infrared heater rebates, and promotes improved O&M practices. In addition, the program builds off of the existing market infrastructure through training and awareness campaigns, and utilizes regional resources where possible.

F. Large C&I Custom Installations Program
(modified)

The Company's proposes to expand its existing Large C&I Custom Installations Program slightly to include eligible GasNetworks® rebated high efficiency gas space heating and water heating equipment. These services were formally offered through a separate program (see III.D. above). Otherwise this program will remain unchanged.

As with the Small / Medium C&I Custom Installations program, this combining of measures and rebate structures into a single program will increase both the efficiency of program administration and should increase penetration by bringing an easily tailored measure menu to the target customer group.

IV. Budget Update for Program Year 2003 and Proposed Program Budget for 2004

A revised budget has been prepared for the 2003 program year, which reflects adjustments due to unspent collections carried over from the prior year, changes to the existing programs and the proposed addition of new programs as discussed in Sections II and III above. Budgets for the 2004 program year are also provided based upon previous program experience and forecasts for program participation and expenses.

The Company's 2003 and proposed 2004 budgets are summarized in Appendix C.

V.   Cost Effectiveness Analyses

Appendix D summarizes the results of the cost-effectiveness analyses performed for FG&E's proposed gas energy efficiency programs. The analyses were conducted in accordance with the guidelines established in D.T.E. 98-100, and all programs (with the exception of low income[5]) were found to be cost-effective.

FG&E has reviewed and updated the current model assumptions, program budgets and program savings and participation goals. Appendix D provides the net present value of benefits and costs and Total Resource Cost ("TRC") results for each program, at the sector level and at the portfolio level. Results for the seven programs combined show an overall portfolio TRC of 1.3.

Programs that are primarily informational and/or educational in nature were not screened individually because the primary objective of these programs is to increase customer awareness of the importance and benefits of energy efficiency and encourage them to make decisions and act on the basis of this awareness. The costs associated with these efforts were included when calculating the sector and overall portfolio-level TRC ratios.

The cost-effectiveness analyses were conducted using Unitil's screening model. This model includes full functionality for estimating and recognizing the benefits and costs associated with market effects when calculating program-level TRC ratios. Screening is conducted using the Total Resource Cost Test, as specified by the Department in D.T.E. 98-100. The table below provides an overview of the major assumptions underlying the cost-effectiveness analyses conducted for FG&E's programs.

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[5] Without consideration of Low Income-specific non-energy benefits, the B/C ratio for FG&E's gas low-income program is 0.9. Given the range of values currently being used by various utilities in the region for non-energy benefits attributable to the low-income sector (i.e., 50% or more of energy benefits), the Company concludes that Department-approved total resource benefits outweigh the cost of this program and that continued implementation of the low-income energy efficiency program is appropriate.

Model Element	Included in TRC Test
Benefits:	

Avoided Gas and Electric Costs
    - Program Participants
    - Market Effects (e.g., spillover,
      post-program adoptions)
	Yes – Based on values developed in December 2001 by the Massachusetts Avoided Energy Supply Component (AESC) Working Group[6]

Customer Benefits (including O&M)	Yes
Quantifiable Avoided Resource Costs (e.g., water)	Yes
Adder for other non-quantified benefits (e.g., environmental and other benefits)	N/A
Costs:	

Program Costs (e.g., incentives, admin, monitoring, evaluation)
    - Program participants
    - Market Effects (e.g., spillover,
      post-program adoptions)
	Yes - Market effects were not included – see footnote #5.

Customer Costs (including O&M)	Yes
Quantifiable Additional Resource Costs	Yes
Utility Performance Incentives	Yes
Other Assumptions:	
General rate of inflation	2.5% per year
Real discount rate	5.19%
Measure savings	Based upon broadly accepted performance data for the specific measure
Measure costs	Based upon broadly accepted full-incremental costs for the measure
Measure lives	Based upon broadly accepted measure life data for each specific measure
Program participation and utility budgets	Developed in conjunction with FG&E's planning and implementation staff.

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[6] Although the model allows for recognition and full quantification of market effects, attempts to quantify these effects were not necessary since the benefit/cost ratios associated with FG&E's implementation of all applicable programs were already equal to, or greater than 1.0.

VI. Lost Base Revenues and Proposed Performance Incentives

As noted in Section II, subsection H of the Settlement Agreement, FG&E recovers all program costs, including lost base revenue ("LBR"), associated with implementation of its Energy Efficiency Plan through an Energy Efficiency Charge ("EEC"), as described in the Company's tariff, M.D.T.E. No. 84, Local Distribution Adjustment Clause, effective November 1, 1999. LBR will be recovered over a seven-year period, determined using the rolling-period method, consistent with the Department's ruling in Colonial Gas Co., D.T.E. 97-112[7].

In addition, consistent with Section 5 of the Department's Final Guidelines in D.T.E. 98-100, beginning in program year 2003, the Company proposes to earn a Performance Incentive, equal to an after tax amount of 5% of program budgets, for successful implementation of the energy efficiency programs. FG&E's proposed incentive mechanism consists of separate benefit/cost ratio and lifetime therm savings design-level targets for each of the residential and commercial/industrial sector levels and includes a 70% threshold and 110% exemplary cap. Performance incentives for 2003 and 2004 have been included in the proposed budget and in the sector and portfolio level TRC calculations.

Appendix E provides details of the proposed incentive and the method by which it has been calculated.

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[7] In December 2002, FG&E implemented new gas rates, approved in Docket No. D.T.E. 02–24/25, Fitchburg Gas and Electric Light Company Gas Division Rate Request, in which lost base revenue (LBR), associated with savings due to energy efficiency program installations prior to January 1, 2001, was reconciled. FG&E's current LBR is calculated on savings associated with program installations completed on or after January 1, 2001.

APPENDICES

Appendix A

Summary – 2001 / 2002 Budget vs. Actual Expenditures

Fitchburg Gas and Electric Light Company
Appendix A
Summary of Budgeted vs. Actual Expenditures
November 1, 2001 through October 31, 2002

	TOTAL EXPENDITURES	BUDGET	PERCENT VARIANCE	PARTICIPATION	ANNUAL THERMS
Residential	(a)	(b)	(a) ÷ (b)	#	
High Efficiency Space Heating	$38,890	$57,300	68%	28	3,581
High Efficiency Water Heating	$18,022	$27,000	67%	12	374
Sub-total	$56,912	$84,300	68%		3,955
Low-Income					
Residential Low-Income	$55,067	$89,900	61%	98	5,319
Sub-total	$55,067	$89,900	61%		5,319
Commercial					
Sm / Med High Eff. Space Heating	$23,847	$50,400	47%	3	18,525
Large Custom Installations	$16,112	$53,200	30%	2	9,580
Sub-total	$39,959	$103,600	39%		28,105
Total	$151,938	$277,800	55%		37,379

Appendix B

Proposed Program Changes

Fitchburg Gas and Electric Light Company

Appendix B

Residential Non-Low Income Energy Efficiency Program Changes

Program Name	Existing Program – 2002 Program Year	Modifications Planned for 2003
GasNetworks® High Efficiency Space Heating Program	• $400 per boiler (forced hot water) installed with AFUE rating $\geq$ 85% • $400 per boiler (steam with electronic ignition) installed with AFUE rating of $\geq$ 82% • $300 per furnace installed with AFUE rating $\geq$ 90%	• FG&E proposes to combine this program with the High Efficiency Heating Program • Increase incentive for eligible boilers (forced hot water only) from $400 to $500 per qualifying unit effective September 1, 2002. • Decrease incentive for eligible furnaces from $300 to $200 per qualifying unit effective September 1, 2002.
GasNetworks® High Efficiency Water Heating Program	• $100 rebate for 75 gallon or less • high efficient natural gas fired water heater w/ minimum energy factor of 0.61, or • a high efficiency indirect fired water heater, or a high efficiency integrated furnace/hot water combo unit.	• FG&E proposes to combine this program with the High Efficiency Heating Program • No planned changes to the rebate or eligibility.
Residential Weatherization Program	• This is a new program initiative for FG&E gas, beginning in November 2002.	• A "piggyback" program to the state-mandated Residential Conservation Services, this program is designed to offer a subsidy for consumers to install attic, wall, and air sealing measures. Other measures included are duct sealing, programmable thermostats, furnace and boiler maintenance and high efficiency window replacement. Rebate levels vary from 33% to 100% depending upon measure type

Fitchburg Gas and Electric Light Company

Appendix B

Low-Income Energy Efficiency Program Changes

Program Name	Existing Program – 2002 Program Year	Modifications Planned for 2003
Residential Low-Income Program	• This program offers weatherization measures to customers with incomes at or below 200% of the federal poverty level. • Services include attic insulation, wall insulation, air-sealing, duct sealing, thermostats, and heating system repair/replacement (on a qualifying basis).	• The Company proposes to increase the income eligibility criteria for customer participation in its Residential Low-Income Program from 200% of the federal poverty level to 60% of median income.

Fitchburg Gas and Electric Light Company

Appendix B

Commercial & Industrial Energy Efficiency Program Changes

Program Name	Existing Program – 2002 Program Year	Modifications Planned for 2003
Small / Medium C&I High Efficiency Space Heating Program	• Rebate program for eligible customers that provides financial incentive for the installation of qualifying, high efficiency furnaces and boilers. • $400 per boiler (forced hot water) installed with AFUE rating $\geq$ 85% • $400 per boiler (steam with electronic ignition) installed with AFUE rating of $\geq$ 82% • $300 per furnace installed with AFUE rating $\geq$ 90%	• The Company proposes to discontinue this program. The GasNetworks® rebates will continue to be available through the C&I Custom Installation programs. • Increase incentive for eligible boilers (forced hot water only) from $400 to $500 per qualifying unit effective September 1, 2002 • Decrease incentive for eligible furnaces from $300 to $200 per qualifying unit effective September 1, 2002
Small / Medium C&I Custom Installations Program	• This is a new program initiative for FG&E gas, beginning in November 2002.	• A new program patterned after Large Custom Installations which promotes installation of high efficiency gas space heating and cooling equipment, water heating equipment, improve operations and maintenance practices, and encourage other custom/site-specific efficiency measures (e.g.: process system, building shell improvements, etc.) for smaller to medium (<80,000 annual therm usage) C/I customers. • The Program will also include eligible GasNetworks® rebated high efficiency gas space and water heating equipment.
Large C&I Custom Installations Program	• Promotes installation of high efficiency gas space heating and cooling equipment, water heating equipment, improve operations and maintenance practices, and encourage other custom/site-specific efficiency measures (e.g.: process system, building shell improvements, etc.) for large(>80,000 annual therm usage) C&I customers.	• The program will be expanded to include eligible GasNetworks® rebated high efficiency gas space heating and water heating equipment. Otherwise the program will remain unchanged.

Appendix C

Proposed Program Budgets
Program Years[8] 2003 and 2004

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[8] FG&E's gas program year runs from November 1 through October 31.

Fitchburg Gas and Electric Light Company
Appendix C

Proposed Energy Efficiency Program Budget
Program Year 2003

line	Program / Initiative	Program Planning & Admin.	Program Marketing	Customer Incentives	Program Implemen-tation	Evaluation & Market Research	Total
	Residential Non-Low Income:						
1	GasNetworks® High-E Space & Water Htg	$ 4,601	$ 1,002	$ 17,952	$ 4,600	$ 1,296	$ 29,450
2	Residential Weatherization	$ 10,370	$ 2,378	$ 48,841	$ 10,370	$ 2,966	$ 74,924
3	Energy Efficiency Website Maintenence	$ 1,583	$ -	$ -	$ -	$ -	$ 1,583
4	**Residential**	$ 16,554	$ 3,379	$ 66,793	$ 14,970	$ 4,262	$ 105,957
	Residential Low-Income:						
5	Residential Low-Income	$ 17,225	$ 3,960	$ 75,741	$ 17,225	$ 4,757	$ 118,907
6	**Low-Income**	$ 17,225	$ 3,960	$ 75,741	$ 17,225	$ 4,757	$ 118,907
	Commercial & Industrial:						
7	Small / Medium Custom installations	$ 6,746	$ 1,574	$ 36,000	$ 6,746	$ 2,099	$ 53,163
8	Large Custom Installations	$ 5,598	$ 1,613	$ 36,000	$ 5,598	$ 2,268	$ 51,078
9	**Commercial & Industrial**	$ 12,344	$ 3,187	$ 72,000	$ 12,344	$ 4,367	$ 104,241
12	**COMPANY TOTALS**	$ 46,122	$ 10,525	$ 214,534	$ 44,539	$ 13,385	$ 329,105

Fitchburg Gas and Electric Light Company
Appendix C

Proposed Energy Efficiency Program Budget
Program Year 2004

line	Program / Initiative	Program Planning & Admin.	Program Marketing	Customer Incentives	Program Implemen-tation	Evaluation & Market Research	Total
	Residential Non-Low Income:						
1	GasNetworks® High-E Space & Water Htg	$ 4,601	$ 1,002	$ 17,952	$ 4,600	$ 1,296	$ 29,450
2	Residential Weatherization	$ 10,370	$ 2,378	$ 48,841	$ 10,370	$ 2,966	$ 74,924
4	Energy Efficiency Website Maintenence	$ 1,900	$ -	$ -	$ -	$ -	$ 1,900
5	**Residential**	$ 16,871	$ 3,379	$ 66,793	$ 14,970	$ 4,262	$ 106,274
	Residential Low-Income:						
6	Residential Low-Income	$ 17,225	$ 3,960	$ 75,741	$ 17,225	$ 4,757	$ 118,907
7	**Low-Income**	$ 17,225	$ 3,960	$ 75,741	$ 17,225	$ 4,757	$ 118,907
	Commercial & Industrial:						
8	Small / Medium Custom installations	$ 6,746	$ 1,574	$ 36,000	$ 6,746	$ 2,099	$ 53,163
9	Large Custom Installations	$ 5,598	$ 1,613	$ 36,000	$ 5,598	$ 2,268	$ 51,078
10	**Commercial & Industrial**	$ 12,344	$ 3,187	$ 72,000	$ 12,344	$ 4,367	$ 104,241
11	**COMPANY TOTALS**	$ 46,439	$ 10,525	$ 214,534	$ 44,539	$ 13,385	$ 329,422

Appendix D

Total Resource Cost Test Results

Fitchburg Gas and Electric Light Company
Appendix D
Total Resource Cost Test Results

November 2002 through October 2004
(combined Program Years 2003 and 2004)

PROGRAMS	Sector	NPV of COSTS		NPV of BENEFITS	Lifetime	
		Shareholder Incentives	Program Total	Program Benefits	Therms Saved	Program TRC Ratio
1 GasNetworks HE Heating & Water Heating	Residential		$72,878	$132,983	328,214	1.8
2 Residential Weatherization	Residential		$155,584	$216,061	523,400	1.4
3 Website Development	Residential		$33,397	$0	0	n/a
4 Low Income Energy Efficiency [1]	Low Income		$231,946	$208,153	481,618	0.9
5 Small / Medium C/I Custom Installations	C & I		$173,928	$320,206	767,520	1.8
6 Large C/I Custom Installations	C & I		$169,858	$286,081	672,000	1.7
7 Sector Totals: [2]	Residential:	$17,591	$279,450	$349,043	851,613	**1.2**
	Low Income:	$18,098	$250,044	$208,153	481,618	**0.8**
	C & I:	$16,524	$360,310	$606,287	1,439,520	**1.7**
	Totals:	**$52,213**	**$889,805**	**$1,163,483**	**2,772,751**	**1.3**

[1] Without consideration of Low Income-specific non-energy benefits, the TRC ratio for FG&E's gas low-income program is 0.9 (at program level). Given the range of values currently being used by various utilities in the region for non-energy benefits attributable to the low-income sector (i.e., 50% or more of energy benefits), the Company concludes that Department-approved total resource benefits outweigh the cost of this program and that continued implementation of the low-income energy efficiency program is appropriate.

[2] Sector TRC ratios include Performance Incentives. Individual program TRC ratios do not.

Appendix E

Proposed Performance Incentive

Fitchburg Gas And Electric Light Company
Proposed Performance Incentive

Table E-1: Performance Incentive, by Sector
November 2002 through October 2003

Residential:

1.	**Total Resource Cost (TRC) Test**			
	a. Target TRC Ratio			1.38
	b. Threshold TRC Ratio			1.00
2.	**Lifetime Therms**			
	a. Target Lifetime Therms			616,308
	b. Threshold Therms	Ln 2a * 70%		431,416
3.	**Program Costs**			
	a. Program Costs -- Budget	Nominal Dollars [Note 1]	$	225,022
4.	**Incentive Percentage**			
	a. Benefit/Cost Percentage			4.07%
	b. Lifetime Therm Percentage			4.07%
5.	**Target Residential Incentive**			
	a. B/C Incentive:	Ln 3a * Ln 4a	$	9,158
	b. Lifetime Therm Incentive:	Ln 3a * Ln 4b	$	9,158
	c. Target Incentive	Ln 5a + Ln 5b	**$**	**18,317**
	d. Cap	Ln 5c * 110%	$	20,148

Commercial & Industrial:

6.	**Benefit/Cost Ratio**			
	a. Target Benefit/Cost Ratio			1.73
	b. Threshold Benefit/Cost Ratio			1.00
7.	**Lifetime MWh**			
	a. Target Lifetime Therm			649,120
	b. Threshold Therm	Ln 7a * 70%		454,384
8.	**Program Costs**			
	a. Program Costs -- Budget	Nominal Dollars [Note 1]	$	104,241
9.	**Incentive Percentage**			
	a. Benefit/Cost Percentage			4.07%
	b. Lifetime Therm Percentage			4.07%
10.	**Target C&I Incentive**			
	a. B/C Incentive:	Ln 8a * Ln 9a		4,243
	b. Lifetime Therm Incentive:	Ln 8a * Ln 9b	$	4,243
	c. Target Incentive	Ln 10a + Ln 10b	**$**	**8,485**

11.	**Total Target Incentive**	Ln 5c + Ln 10c	**$**	**26,802**
12.	**Performance Incentive Rate**	Before Tax [Note 2]		**8.14%**

Notes:

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1. Program costs shown in Table 23 - Lines 3a and 8a are in nominal dollars. Program costs shown on Table 24, Lines 2 and 7 are in NPV 2003$'s.
2. Incentive Rate after tax is 5%. FG&E's current effective tax rate is 38.57%. Before tax rate calculation: 5% ÷ (1 - 38.57%) = 8.14%.

Fitchburg Gas And Electric Light Company
Proposed Performance Incentive

Table E-2:   Total Resource Cost Test, by Sector
November 2002 through October 2003

			NPV $2003
Residential:			**Planned**
1. Program Benefits	Note 1	$	246,444
2. Program Costs (excluding Shareholder Incentive)		$	167,461
3. Customer Contribution		$	11,019
4. Total Costs		$	178,480
5. **TRC Test -- Residential**	Ln 1 ÷ Ln 4		**1.38**

			NPV $2003
Commercial & Industrial:			**Planned**
6. Program Benefits	Note 1	$	273,435
7. Program Costs (excluding Shareholder Incentive)		$	94,969
8. Customer Contribution		$	63,397
9. Total Costs		$	158,366
10. **TRC Test -- C&I**	Ln 6 ÷ Ln 9		**1.73**

Notes:

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1. Program costs shown in Lines 2 and 7 are in NPV 2003$'s. Program costs
    shown in Table 1 are in nominal dollars.

Fitchburg Gas And Electric Light Company
Proposed Performance Incentive

Table E-3:   Lifetime Therm Savings, by Sector
**   November 2002 through October 2003**

|	Lifetime Th Planned
Residential:	
1. GasNetworks (Residential)	137,120
2. Residential Weatherization	253,647
3. Low Income Efficiency	225,541
4. Website Development / Maintenance	-
5. **Total Residential**	**616,308**
Commercial & Industrial:	
6. Small / Medium C&I Custom	341,120
7. Large C&I Custom	308,000
8. **Total Commercial & Industrial**	**649,120**

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FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
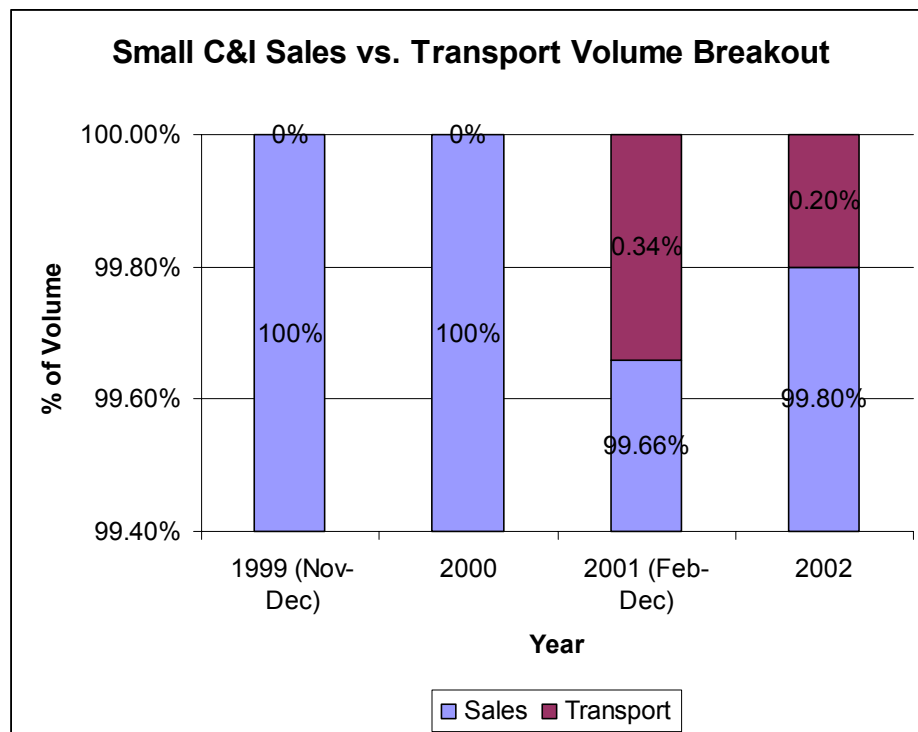2003 INTEGRATED GAS RESOURCE PLAN
Docket No. D.T.E. 03-52

COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-24   Please present figures, in the same fashion as Figure 4 (see page 54 of the Company's filing), showing the small and medium C&I firm sales customers vs. firm transportation customers for the period 1999-2002.

Company Response:

Please see Charts DTE 2-24(a) and DTE 2-24(b) below. Please note that there were no transportation customers in the small or medium C&I classes in 1999 or 2000.
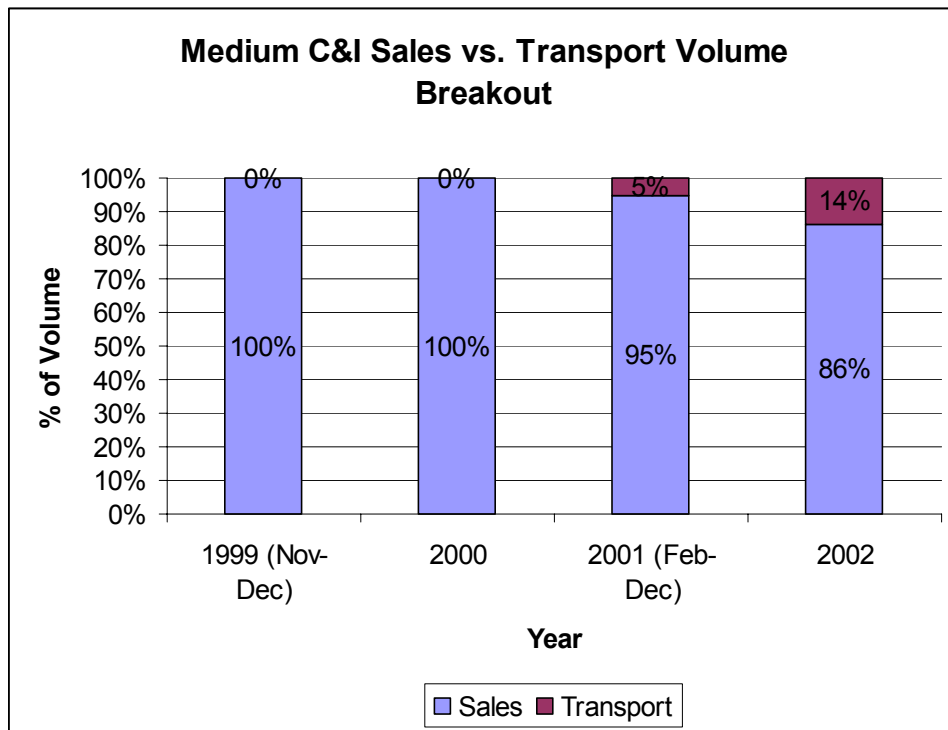
Chart DTE 2-24(a)
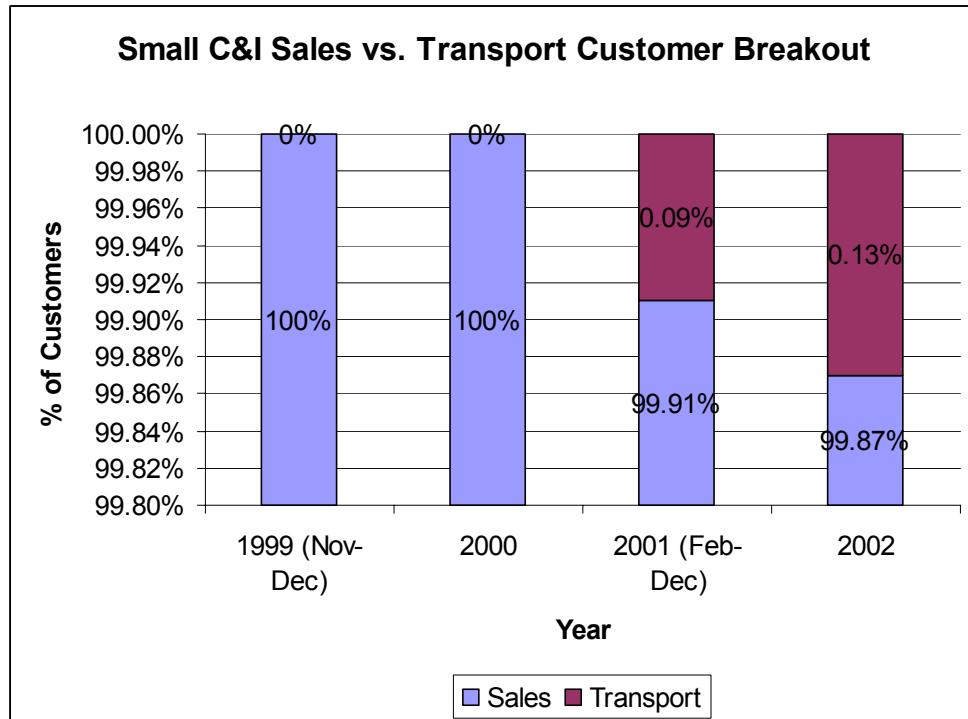
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2003 INTEGRATED GAS RESOURCE PLAN
Docket No. D.T.E. 03-52

COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-24 (Continued)

Chart DTE 2-24(b)
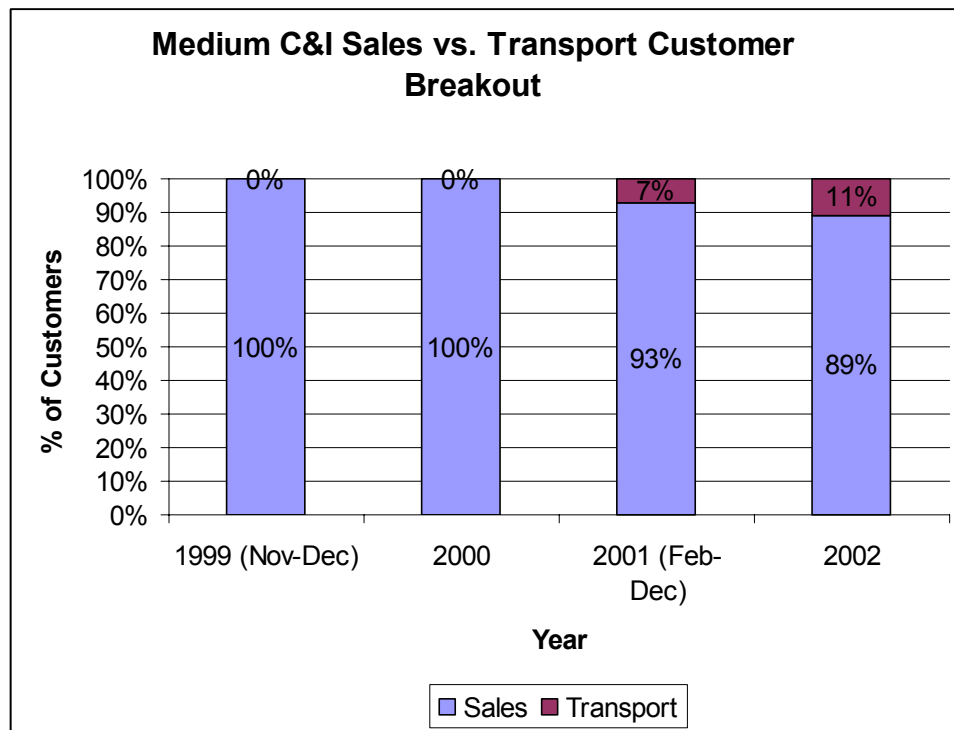
Person Responsible: Robert B. Hevert

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FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
2003 INTEGRATED GAS RESOURCE PLAN
Docket No. D.T.E. 03-52

COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-25   Please present Figures, in the same fashion as Figure 5 (see page 55 of the Company's filing), showing the small and medium C&I firm sales volumes vs. firm transportation volumes for the period 1999-2002.

Company Response:

Please see Charts DTE 2-25(a) and DTE 2-25(b) below. Please note that there were no transportation customers in the small or medium C&I classes in 1999 or 2000.

Chart DTE 2-25(a)

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FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
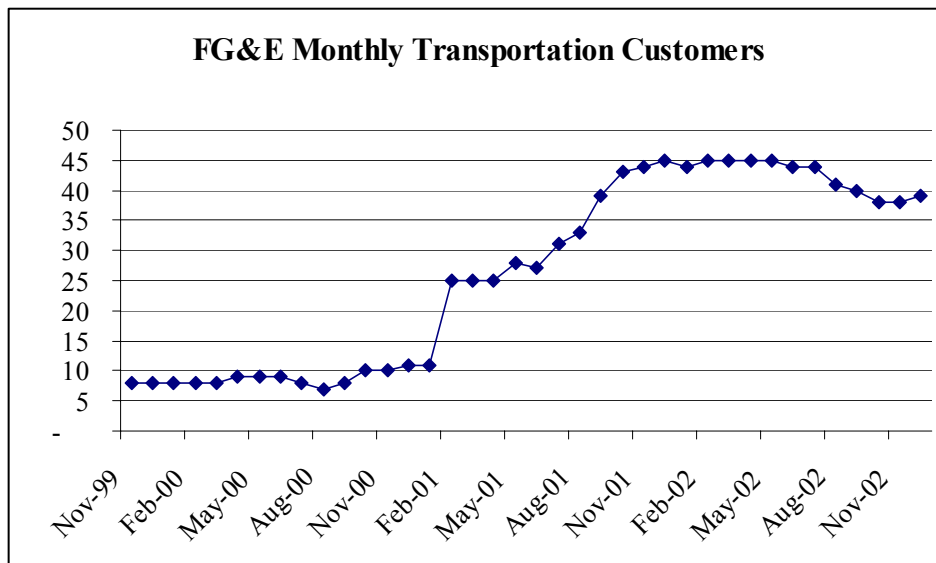**2003 INTEGRATED GAS RESOURCE PLAN**
Docket No. D.T.E. 03-52

COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-25 (Continued)

Chart DTE 2-25(b)

Person Responsible: Robert B. Hevert

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COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-26   Please explain why the Company develops the "FT-Base Case Scenario" based on actual data from only December 2002 and not from a longer historical period.

Company Response:

CEA reviewed the trend in customer migration since the FG&E customer choice program was instituted in November 1999. As is illustrated by Chart DTE 2-26 below, transportation customer migration peaked in May 2002, and subsequently declined from those levels. In addition, it was CEA's understanding that a certain number of third party suppliers were considering not renewing their contracts to capacity assigned customers and thus would require these retail supply customers to return to the FG&E system service once their contracts terminated. Based on that information, it was reasonable to develop for a scenario wherein transportation migration remained at the most recently recorded levels. At the time the analysis was completed, that data point was December 2002.

Chart DTE 2-26

FG&E Monthly Transportation Customers

Person Responsible: Robert B. Hevert and Rich MacInnis.

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DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

FITCHBURG GAS AND ELECTRIC LIGHT COMPANY
2003 INTEGRATED GAS RESOURCE PLAN
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COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-27   Please refer to page 57 of the Company's filing. The Company states that it is reasonable to expect reverse migration given the lack of growth in activity by competitive suppliers. Please discuss in detail why the Company thinks that the lack of growth in activity by competitive suppliers will continue during the forecast period.

Company Response:

As suggested in response to DTE 2-26, the Company received notification from third party suppliers that they were phasing out their pursuit of retail customers on FG&E's system and would not be renewing their supply arrangements with the customers they were serving upon completion of their contracts. In addition, CEA is aware of several third party marketers that have discontinued sales service in Massachusetts. CEA did not have any information to suggest that this inactivity, or reduced level of activity, on the part of third party marketers would be reversed and therefore determined that the more conservative approach would be to plan for the scenario wherein the present market conditions persisted through the forecast period.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

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COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-28   Please state whether or not the Company has Grandfathered C&I transportation customers. If yes, please explain how the Company forecasted the number of customers and their corresponding volumes for all the transportation scenarios.

Company Response:

Fitchburg Gas and Electric Light Company does not have any Grandfathered C&I transportation customers.

Person Responsible: Richard MacInnis

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

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COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-29   Please refer to page A-7 of the Appendix of the Company's filing. Please explain why "Interruptible" is not applicable.

Company Response:

Similar to the approach utilized in FG&E's most recent integrated gas resource plant filings, the 2003 Integrated Gas Resource Plan provides forecasts and supply needs for firm customers. As such, historical data and forecasts for interruptible customers were not included in this filing.

Person Responsible: Robert B. Hevert

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

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COMPANY'S RESPONSES TO THE DEPARTMENT'S
SECOND SET OF INFORMATION REQUESTS

DTE 2-31   Please describe the level of training, technical competence, and industry
              experience of each Commonwealth Energy Advisor' staff who was directly
              involved in the preparation of the econometric model design and forecast results
              Report.

Company Response:

Please see the attached resumes.

Person Responsible: Robert B. Hevert

Robert B. Hevert, CFA
President

Mr. Hevert is an economic and financial consultant with broad experience in the energy industry. He has an extensive background in the areas of corporate strategic planning, energy market assessment, corporate finance, mergers, and acquisitions, asset-based transactions, asset and business unit valuation, market entry strategies, strategic alliances, project development, feasibility and due diligence analyses. Mr. Hevert has significant management experience with both operating and professional services companies.

REPRESENTATIVE PROJECT EXPERIENCE

Financial and Economic Advisory Services

Retained by numerous leading energy companies and financial institutions throughout North America to provide services relating to the strategic evaluation, acquisition, sale or development of a variety of regulated and non-regulated enterprises. Specific services have included: developing strategic and financial analyses and managing multi-faceted due diligence reviews of proposed corporate M&A counter-parties; developing, screening and recommending potential M&A transactions and facilitating discussions between senior utility executives regarding transaction strategy and structure; performing valuation analyses and financial due diligence reviews of electric generation projects, retail marketing companies, and wholesale trading entities in support of significant M&A transactions.

Specific divestiture-related services have included advising both buy and sell-side clients in transactions for physical and contractual electric generation resources. Sell-side services have included: development and implementation of key aspects of asset divestiture programs such as marketing, offering memorandum development, development of transaction terms and conditions, bid process management, bid evaluation, negations, and regulatory approval process. Buy-side services have included comprehensive asset screening, selection, valuation and due diligence reviews. Both buy and sell-side services have included the use of sophisticated asset valuation techniques, and the development and delivery of fairness opinions.

Specific corporate finance experience while a Vice President with Bay State Gas included: negotiation, placement and closing of both private and public long-term debt, preferred and common equity; structured and project financing; corporate cash management; financial analysis, planning and forecasting; and various aspects of investor relations.

Representative non-confidential clients have included:
- Conectiv generation asset divestiture
- Eastern Utilities Associates (prior to acquisition by National Grid, PLC) generation asset divestiture
- Niagara Mohawk – sale of Niagara Mohawk Energy
- Potomac Electric Company generation asset divestiture

Representative confidential engagements have included:
- Buy-side valuation and assessment of merchant generation assets in Midwestern US
- Buy-side due diligence and valuation of wholesale energy marketing companies in Eastern and Midwestern US
- Buy-side due diligence of natural gas distribution assets in Northeastern US
- Financial feasibility study of natural gas pipeline in upper Midwestern US
- Financial valuation of natural gas pipeline in Southwestern US

Regulatory Analysis and Ratemaking

On behalf of electric, natural gas and combination utilities throughout North America, provided services relating to energy industry restructuring including merchant function exit, residual energy supply obligations, and stranded cost assessment and recovery. Also performed rate of return and cost of service analyses for municipally owned gas and electric utilities. Specific services provided include: performing strategic review and development of merchant function exit strategies including analysis of provider of last resort obligations in both electric and gas markets; and developing value optimizing strategies for physical generation assets.

Representative engagements have included:

- Performing rate of return analyses for use in cost of service analyses on behalf of municipally owned gas and electric utilities in the Southeastern and Midwestern US
- Developing merchant function exit strategies for Northeastern US natural gas distribution companies
- Developing regulatory and ratemaking strategy for mergers including several Northeastern natural gas distribution companies

Litigation Support and Expert Testimony

Provided expert testimony and support of litigation in various regulatory proceedings on a variety of energy and economic issues including the proposed transfer of power purchase agreements, procurement of residual service electric supply, the legal separation of generation assets, and specific financing transactions. Services provided also included collaborating with counsel, business and technical staff to develop litigation strategies, preparing and reviewing discovery and briefing materials, preparing presentation materials and participating in technical sessions with regulators and intervenors.

Energy Market Assessment

Retained by numerous leading energy companies and financial institutions nationwide to manage or provide assessments of regional energy markets throughout the US and Canada. Such assessments have included development of electric and natural gas price forecasts, analysis of generation project entry and exit scenarios, assessment of natural gas and electric transmission infrastructure, market structure and regulatory situation analysis, and assessment of competitive position. Market assessment engagements typically have been used as integral elements of business unit or asset-specific strategic plans or valuation analyses.

Representative engagements have included:
- Managing assessments of the NYPOOL, NEPOOL and PJM markets for major North American energy companies considering entering or expanding their presence in those markets
- Assessment of ECAR, MAPP, MAIN and SPP markets for a large US integrated utility considering acquisition of additional electric generation assets
- Assessment of natural gas pipeline and storage capacity in the SERC and FRCC markets for a major international energy company

Resource Procurement, Contracting and Analysis

Assisted various clients in evaluating alternatives for acquiring fuel and power supplies, including the development and negotiation of energy contracts and tolling agreements. Assignments also have included developing generation resource optimization strategies. Provided advice and analyses of transition service power supply contracts in the context of both physical and contractual generation resource divestiture transactions.

Business Strategy and Operations

Retained by numerous leading North American energy companies and financial institutions nationwide to provide services relating to the development of strategic plans and planning processes for both regulated and non-regulated enterprises. Specific services provided include: developing and implementing electric generation strategies and business process redesign initiatives; developing market entry strategies for retail and wholesale businesses including assessment of asset-based marketing and trading strategies; and facilitating executive level strategic planning retreats. As Vice President, Energy Ventures, of Bay State was responsible for the company's strategic planning and business development processes, played an integral role in developing the company's non-regulated marketing affiliate, EnergyUSA, and managed the company's non-regulated investments, partnerships and strategic alliances.

Representative engagements have included:
- Developing and facilitating executive level strategic planning retreats for Northeastern natural gas distribution companies
- Developing organization and business process redesign plans for municipally owned gas/electric/water utility in the Southeastern US

- Reviewing and revising corporate merchant generation business plans for Canadian and US integrated utilities
- Advising client personnel in development of business unit level strategic plans for various natural gas distribution companies

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PROFESSIONAL HISTORY

Commonwealth Energy Advisors, Inc. (2002 – Present)
President

Navigant Consulting, Inc. (1997 - 2001)
Managing Director (2000 – 2001)
Director (1998 – 2000)
Vice President, REED Consulting Group (1997 – 1998)

REED Consulting Group (1997)
Vice President

Bay State Gas Company (1987 - 1997)
Vice President, Energy Ventures and Assistant Treasurer

Boston College (1986 - 1987)
Financial Analyst

General Telephone Company of the South (1984 - 1986)
Revenue Requirements Analyst

EDUCATION

M.B.A., University of Massachusetts, Amherst, 1984
B.S., University of Delaware, 1982

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Chartered Financial Analyst, 1991
Association for Investment Management and Research
Boston Security Analyst Society

PUBLICATIONS/PRESENTATIONS

Has made numerous presentations throughout the United States and Canada on several topics including:
- Generation Asset Valuation and the Use of Real Options
- Retail and Wholesale Market Entry Strategies
- The Use Strategic Alliances in Restructured Energy Markets
- Gas Supply and Pipeline Infrastructure in the Northeast Energy Markets
- Nuclear Asset Valuation and the Divestiture Process

AVAILABLE UPON REQUEST

Extensive client and project listings, and specific references.

James M. Stephens

Vice President

Mr. Stephens is an economic and business consultant with broad experience in the energy industry. He has an extensive background in the areas of energy market assessment, resource planning and procurement, mergers and acquisitions, asset-based transactions, asset and business unit valuation, market entry strategies, strategic alliances, project development, feasibility and due diligence analyses. In addition to his consulting experience, Mr. Stephens served as President of a start-up retail energy marketing company, where he had responsibility for financial performance, developing and executing strategy and participation in regulatory initiatives and proceedings. Also, Mr. Stephens, as Director of Gas Supply Planning and Acquisition, has developed and implemented natural gas acquisition strategies that included: demand modeling, portfolio analysis and procurement activities. Finally, Mr. Stephens has significant management experience with both operating and professional services companies.

REPRESENTATIVE PROJECT EXPERIENCE

Financial and Economic Advisory Services

Involved in the sale or evaluation of several non-regulated energy companies including wholesale and retail energy marketing companies, on-line energy brokers and energy services' companies. Specific services provided include: business unit evaluation, development of sale materials, marketing of transaction, bid evaluation and negotiation support. These engagements have resulted in completed sales or strategy changes.

Representative engagements have included:
- Sale of Niagara Mohawk Power Corporation's non-regulated energy marketing affiliate
- Sale of Providence Energy Corporation's non-regulated marketing affiliate
- Performed an independent valuation of an on-line energy broker on behalf of an investor

Regulatory Analysis and Support

On behalf of electric, natural gas and combination utilities throughout North America, provided services relating to energy industry restructuring including merchant function exit, residual energy supply obligations, stranded cost assessment and recovery, and management prudence. Specific services provided include: performing strategic review and development of merchant function exit strategies including analysis of provider of last resort obligations in both electric and gas markets,

developing new service offerings for third party marketers, and provide litigation support to utilities during prudence investigations.

Representative engagements have included:
- On behalf of a midwest utility, developed and implemented a third party transportation program
- On behalf of a gas utility reviewed supply procurement practices and developed prudence testimony
- Assisted an LDC consortium in their review of pipeline cost allocations procedures and rate design methodologies. Also supported settlement discussions.

Energy Procurement

Directed and participated in the review of several energy procurement projects including demand modeling, portfolio review/optimization, procurement strategies and associated cost structures.

Representative engagements/experience have included:
- On behalf of a natural gas utility developed a demand forecast and supported that forecast in regulatory proceedings
- For a combination utility, assisted in the development and support of gas supply planning standards and the associated cost of these standards
- On behalf of a financial institution, reviewed the competitiveness of a storage project investment and quantified the impact of various new projects on the storage project financial performance

Energy Market Assessment

Retained by numerous leading energy companies to manage or provide assessments of regional energy markets throughout the US and Canada. Such assessments have included development of electric and natural gas price forecasts, analysis of generation project entry and exit scenarios, assessment of natural gas and electric transmission infrastructure, market structure and regulatory situation analysis, and assessment of competitive position. Market assessment engagements typically have been used as integral elements of business unit or asset-specific strategic plans or valuation analyses.

Representative engagements have included:
- Managing the assessment of the FRCC market for an international energy company considering asset development opportunities in Florida
- Assessing the northeast US and eastern Canada energy markets for an energy company considering a pipeline expansion
- Reviewing energy contract practices and pricing mechanisms to support a contract arbitration process

Business Strategy and Operations

Retained by numerous leading North American energy companies to provide services relating to the development of strategic plans and planning processes for both regulated and non-regulated enterprises. Specific services provided include: developing and implementing electric generation strategies and business process redesign initiatives; and developing market entry strategies for retail and wholesale businesses including assessment of asset-based marketing and trading strategies.

Representative engagements have included:
- Assisted a northeast LDC develop a business plan for its non-regulated energy business
- Evaluated strategic alliances for a New England LDC that was entering the fuel oil business
- Developed new service offerings including firm transportation and stand-by service for a mid-Atlantic utility
- Managed the re-engineering of a large midwest LDC's gas supply procurement process
- Managed the re-engineering of a mid-Atlantic wholesale energy marketing company's gas operations

PROFESSIONAL HISTORY

Commonwealth Energy Advisors, Inc. (2002 – Present)
Vice President

Navigant Consulting, Inc. (2000 - 2001)
Director – Energy Market Assessment Practice Area

Providence Energy Services (1997-2000)
President, (1998 – 2000)
President, Providence-Southern (1997 – 1998)

REED Consulting Group (1994 - 1997)
Assistant Vice President

Colonial Gas Company (1991 - 1994)
Director, Gas Supply Planning and Acquisition (1993 – 1994)
Manager, Gas Supply (1991 – 1993)

Boston Gas Company   (1987 - 1991)
Senior Gas Supply Analyst

EDUCATION

M.B.A., Bentley College, 1991
B.S., Bentley College, 1987

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Member of the AGA
Member to the APGA
Member of the New England Gas Association

AVAILABLE UPON REQUEST
Extensive client and project listings, and specific references

Ann E. Bulkley
Project Manager

A Project Manager with a strong foundation in economic principles, finance, regulatory policies and quantitative forecasting. Provides management and technical support on projects involving valuation, merger and acquisition due diligence, restructuring, and regulatory and litigation support.

REPRESENTATIVE PROJECT EXPERIENCE

Strategy

Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.

Valuation

Significant experience utilizing numerous valuation methodologies to value generation assets for strategic planning, tax, financing and other purposes. Methodologies include traditional discounted cash flow, Monte Carlo risk analysis, market analysis and replacement cost. Prepared expert reports, testimony and certifications for use in regulatory and state judicial forums.

Prepared a valuation of numerous generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis and a risk analysis.

Prepared a valuation of numerous purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and VAR for the selling utility.

Prepared a valuation of several FirstEnergy generating facilities using the income, cost, and comparable sales approaches as well as risk analysis. Prepared an independent report.

Prepared a valuation of Northern Indiana Public Service Company's generation, transmission and distribution assets for a recent electric rate proceeding. Valuation approaches used in this project included income, cost and comparable sales approaches.

Unbundling

Significant experience working with LDCs to unbundle regulated utility sales service into its unregulated components as part of the companies' overall restructuring plans. Prepared testimony supporting various LDC's unbundling proposals. Provided expert testimony on behalf of a gas utility supporting unbundling proposals, ancillary services and associated ratemaking and implementation issues. Acted as an advisor to state agencies regarding natural gas restructuring issues. Assisted in the development of state policy decisions with regards to gas industry unbundling, as part of a collaborative effort, to identify and resolve the critical issues surrounding unbundling. Advised on the development of regulations and terms and conditions necessary to implement retail choice.

Cost Allocation/Rate Design

Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Analyzed and evaluated rate application. Attended hearings and conducted investigation of rate application for regulatory staff. Prepared, supported and defended recommendations for revenue requirements and rates for the company. Developed rates for gas utility for transportation program and ancillary services.

Gas Supply

Advised LDCs with regards to outsourcing of their gas supply management function. Performed a statistical analysis to determine the value to the LDC of several gas supply management proposals. Evaluation included an analysis of the financial implications of the terms and conditions of each proposal under varying supply, pricing and demand scenarios.

Performance-Based Ratemaking

Analyzed the implementation of performance-based ratemaking in the electric industry and in the corporate strategies of private sector organizations. Evaluated the effect of various performance-based ratemaking mechanisms in earnings and corporate strategies for two electric utilities. Analyzed a performance-based ratemaking proposal for the regulatory agency to determine the viability of the program and the impact on ratepayers.

Reengineering and Restructuring

Acted as an advisor to state regulators with regards to the unbundling of the natural gas industry. Worked with utilities, marketers and state agencies, in a collaborative forum, to clearly identify the underlying cost structure for each customer class and to evaluate the impact that alternative approaches retail choice would have on each customer segment. Worked with the Collaborative to identify the appropriate approach to the retail choice offering and develop the terms and conditions for the program.

Participated in the reengineering of a gas supply department of a major midwestern gas distribution company. Interviewed staff to determine present work allocation and workflow. Performed gap and duplicative process analyses. Designed ideal workflow for new transportation service offerings. Created job descriptions. Analyzed present operations in conjunction with ideal workflow to create

efficiencies. Analyzed and capsulated proposals for gas management system and provided recommendations.

Assisted in the development of an IS system to accommodate transportation services. Utilized detailed workflow diagrams to educate IS department on the operations area needs from the systems.

Generation Divestiture

Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract. Assisted clients in implementing generation divestiture programs. Acted as a liaison between the bidders and the seller in the divestiture process. Provided documentation, detailed due diligence and marketing support. Participated in site tour development, training and implementation.

Joint Ventures/Alliances/ Mergers and Acquisitions

Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed, and evaluated potential alliance candidates based on company-established criteria for several LDAC's and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.

Economic Analysis

Analyzed various industries, concentrating primarily in electronics. Conducted research on high technology markets for trade publications. Forecasted investment levels, product shipments, and business and consumer spending levels for the electronics, transportation, and printing industries. Forecasting methodology based on time-series-business cycle approach. Prepared electronics and logistics industry outlooks for advertising sales force and external clients.

PROFESSIONAL HISTORY

Commonwealth Energy Advisors, Inc. (2002 – Present)
Project Manager

Navigant Consulting, Inc. (1995 – 2002)
Senior Engagement Manager

Cahners Publishing Company (1995)
Economist

EDUCATION

M.A., Economics, Boston University, 1995
B.A., Economics and Finance, Simmons College, 1991

Melissa F. Bartos
Senior Consultant

A senior consultant with a strong mathematical and computer background. Expertise in complex spreadsheet modeling and developing databases for data management and analysis. Experienced in programming using Visual Basic for Applications (VBA) in Excel in order to create, design, redesign and synthesize various models and databases. Also researches regulatory issues, performs economic analysis, and assists in writing reports and testimony.

REPRESENTATIVE PROJECT EXPERIENCE

Modeling and Analysis

Designed and developed numerous models including an optimization model to test various electricity send-out strategies based on market prices and available transmission capacity; a model to compare current and projected pipeline capacity with forecast demand in order to determine operational implications and possible strategic initiatives for a Northeast pipeline; risk management models to evaluate utility exposure under several rate strategies; and a model to evaluate gas supply outsourcing proposals received by a New England utility using the Monte Carlo simulation process to test the proposals under various risk scenarios including hub price, basis differential, and customer demand changes, in order to determine which would be the least cost and least risk option.

Valuation

Prepared valuations of numerous generation facilities, supply portfolios, and PPAs. Approaches utilized include the income (DCF), cost, and comparable sales approaches. Specific circumstances have included valuing the benefit of fuel switching capabilities as well as Monte-Carlo risk analysis to take into consideration uncertain operating conditions and market prices. Also assisted in the preparation of valuation reports and testimony. Sample assignments include valuing numerous generation assets to be used for strategic planning purposes; conducting a valuation of numerous purchase power contracts, analyzing bids from potential acquirers, assessing credit issues, and analyzing VAR for the selling utility in a sale of purchase power contracts; and valuing Northern Indiana Public Service Company's generation, transmission and distribution assets for a recent rate proceeding.

Cost-of-Service and Rate Design

Designed and built a cost-of-service model used company-wide in various cost-of-service projects. Also redesigned cost-of-service and rate design models for a West Coast municipal electric company and a major East Coast electric utility. Prepared an extended cost-of-service study to provide information about unbundling revenue-cycle services. Manipulated and enhanced a rate design

model in order to explore alternatives for recovering post-divestiture stranded costs through CTC charges in preparation for a regulatory filing and to investigate seasonal market credit options.

Assisted with the preparation of testimony in support of Southern Connecticut Gas Company's unbundling filing. Prepared a gas-only cost-of-service study. Assisted with development of transportation programs, allocation of costs, and development of rates. Analyzed customer migration and assisted with the preparation of interrogatories. Drafted testimony in support of the LDC's application for a change in its pricing structure.

Electric Reliability

Designed and developed a customized database for analyzing electric distribution reliability which includes functionality to manage summarizing standard data, flexibility to handle customized detailed analysis, and the ability to address data integrity issues. Performed data analysis on outage history, physical attributes of equipment, and historical spending in order to provide a strategic asset management approach to reliability. This included presenting recommendations for targeted spending of distribution reliability funds and facilitating one-day seminar designed to discuss reliability issues with over 70 client employees. Assisted with an electric reliability assessment for multiple utilities including analyzing outage data in order to develop relationships between expenditures and reliability improvement.

Market Power Analysis

Performed market power analysis in support of the proposed merger between Boston Edison Company and Commonwealth Energy in accordance with the FERC's guidelines regarding merger applications. Evaluated the applicants' uncommitted capacity, total capacity, economic capacity, and available economic capacity. Other market power analysis experience includes preparing studies in support of KeySpan's purchase of Consolidated Edison's Ravenswood facility in New York City, a market based rate application for a cogeneration facility in New York, and in preparation of the sale of PEPCo's generation assets.

Research

Conducted extensive research in support of expert reports and testimony. Research topics have included gas unbundling topics, including exiting the merchant function, supplier of last resort, after merchant service, balancing, nominations, and cashouts; pipeline rate cases to determine business risks associated with rate of return on equity; standard offer rate provisions for utilities in the Northeast; the regulatory treatment of divestiture proceeds; status and details of electric restructuring in various locations; various generation asset transactions; industry mergers and acquisitions; and potential alliance candidates for LDCs.

PROFESSIONAL HISTORY

Commonwealth Energy Advisors, Inc. (2002 – Present)
Senior Consultant

Navigant Consulting, Inc. (1996 – 2002)
Senior Consultant

EDUCATION

M.S., Mathematics (Statistics), University of Massachusetts at Lowell, Degree in Progress
B.A., Mathematics and Psychology, Computer Science minor, College of the Holy Cross, *magna cum laude*, 1998